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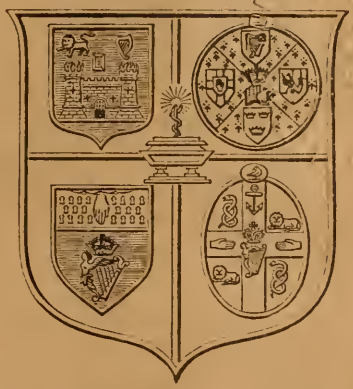

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Fellow and Registrar.

COLLEGE HALL, KILDARE-STREET, DUBLIN.
October, 1893.

Royal Colleges of Physicians & Surgeons of Edinburgh,

AND

Faculty of Physicians and Surgeons of Glasgow.

COPIES of REGULATIONS for the TRIPLE QUALIFICATION (L.R.C.P.E., L.R.C.S.E., and L.F.P. & S.G.), and the Diploma in Public Health, containing dates of Professional Examinations for year 1893-94. Curriculum, &c., may be had on application to JAMES ROBERTSON, Solicitor, 1 George-square, Edinburgh, or to ALEXANDER DUNCAN, B.A., 242 St. Vincent-street, Glasgow, Inspectors and Treasurers, at Edinburgh and Glasgow, respectively.

In applying for copies, Students will please state the date of their commencement of Medical Study.

College of Physicians of Edinburgh.

THE EXAMINATIONS for the MEMBERSHIP of the COLLEGE will be held during the ensuing year on the

10th and 11th October, 1893;	10th and 11th April, 1894; and
9th and 10th January, 1894;	10th and 11th July, 1894.

Candidates for the MEMBERSHIP are requested to submit their applications and Testimonials with the Secretary fourteen days before the dates on which they wish to appear for Examination.

The EXAMINATIONS for the LICENCE of the COLLEGE for the ensuing year will be held on the first Wednesday, and following days, of every month, except in September and October.

Candidates for the LICENCE (as a single qualification) are requested to send their names to the Secretary one week before the dates on which they wish to appear for Examination.

For the Regulations in regard to the various qualifications granted by the College, and in regard to all other information, application may be made to the Secretary.

G. A. GIBSON, M.D., *Honorary Secretary.*

EDINBURGH, *August*, 1893.

NOTICE.

THE MEDICAL PRELIMINARY EXAMINATIONS, conducted by the EDUCATIONAL INSTITUTE of SCOTLAND, will be held in the ODDFELLOWS' HALL, Forrest-road, Edinburgh, and in the FREE CHURCH TRAINING COLLEGE, Glasgow, on the following days, beginning each day at 11 a.m.:—

28th, 29th, 30th September, 1893;	5th, 6th, 7th July, 1894;
5th, 6th, 7th April, 1894;	4th, 5th, 6th October, 1894.

THOMAS MORRISON, LL.D., F.E.I.S, *Principal of the Free Church Training College, Glasgow; Secretary to the Board of Examiners.*

Particulars on application to ALEXANDER MACKAY, LL.D., F.E.I.S., 10A South St. Andrew-street, Edinburgh, from whom Calendars, price 1/–, can be obtained.

EDINBURGH, *August*, 1893.

Catholic University School of Medicine.

WINTER LECTURES commence NOVEMBER 2nd; SUMMER LECTURES APRIL 1st. Dissecting Room open October 2nd.

Anatomy—A. Birmingham, M.D., F.R.U.I.
Physiology—C. Coppinger, M.D., F.R.U.I. and D. J. Coffey M.B.
Chemistry—J. Campbell, M.D., F.R.U.I.
Surgery—P. J. Hayes, M.D., M.CH., F.R.U.I.
Medicine—Christopher J. Nixon, M.D.
Midwifery—A. J. Smith, M.B., EX-R.U.I.
Physics—J. H. Stewart, B.SC., F.R.U.I.
Materia Medica and Pharmacy—F. J. B. Quinlan, M.B., EX-R.U.I., & R.C.P. & S.
Med. Jurisprudence and Public Health—Antony Roche, M.R.C.P., EX-R.U.I.
Pathology—E. J. M'Weeney, M.D., EX-R.U.I.
Biology—Geo. Sigerson, M.D., F.R.U.I. and A. J. Blaney, M.B., F.R.U.I.
Bacteriology—E. J. M'Weeney, M.D., EX-R.U.I.
Ophthalmology—L. Werner, M.B., EX-R.U.I. & T.C.D.

EXHIBITIONS, &c.—Four, value £14 14s.; Two, value £10; Two Gold and Fifteen Silver Medals.

BEGINNERS should, if possible, attend at the School on or before October 12th, on which date the Introductory Course commences. It has been specially arranged to introduce beginners to the Study of Medicine. All Students of the School may attend free.

SCHOOL IMPROVEMENTS.—The School has been recently rebuilt, and nearly doubled in size; several new Laboratories, including those for the teaching of Public Health and Bacteriology, have been added.

The Lectures delivered in the Schools are sufficient for all Medical Examining Bodies in the United Kingdom.

Any Course of Lectures may be attended by Students of other Schools.

A Guide for Students, giving all information required by those commencing the study of medicine, and further particulars, may be obtained on application to—

THE REGISTRAR,
MEDICAL SCHOOL, CECILIA-STREET, DUBLIN.

ST. VINCENT'S HOSPITAL AND DISPENSARY AND SCHOOL OF MEDICINE AND SURGERY,

STEPHEN'S-GREEN, DUBLIN.

THE Medical Board beg to announce that the WINTER SESSION, 1893-94, will begin on OCTOBER 2nd. In consequence of the great success attending the combined practical and theorectical instruction given for the last few years to the Junior Students, the Board have extended the system. In every department the teaching is now thoroughly systematised, and a full course of theoretical instruction is given and illustrated by cases in the wards; thus bringing clinical teaching to its highest development. A special feature is the Junior Class, which meets for practical work at 10 a.m. daily during the Session.

Consultant—Dr. Quinlan
Physician and Lecturer on Medicine—Dr. Cox.
Physician & Lecturer on Medicine—Dr. M'Hugh.
Physician to Extern Department and Assistant. Lecturer—Dr. Savage.
Surgeon and Lecturer on Surgery—Surgeon M'Ardle,
Surgeon and Lecturer on Surgery—Surgeon Tobin.
Surgeon to Extern Department and Assistant Lecturer—Surgeon Patteson.
Gynæcologist and Lecturer on Gynæcology—Dr, Smith.
Ophthalmic Surgeon and Lecturer on Diseases of the Eye and Ear—Mr. Odevaine, F.R.C.S.I.
Pathologist and Lecturer on Pathology—Dr. Patteson.
Dentist and Lecturer on Dentistry—Mr. Bloom.
Pharmaceutist and Lecturer on Pharmacy—Mr. Flood.
Resident Surgeon—Mr. Barrett.
Resident Physician—Dr. Marnell.

A prospectus, giving full information on all points, will be sent to all applicants by the Hon. Secretary. A Medical Agency has been formed in connection with this Hospital, and the Medical Profession in want of Assistants or gentlemen to act as *locum tenens* are invited to apply to the Secretary of the Medical Board.

DOCTOR MCHUGH, 25 *Harcourt-street, Dublin.*

Coombe Lying-in Hospital and Guinness Dispensary

FOR THE TREATMENT OF DISEASES PECULIAR TO WOMEN.

Founded A.D. 1826. *Incorporated by Royal Charter*, 1867.

MASTER.

J. Colclough-Hoey, L.R.C.S., L.R.C.P.I., &c., 37 Westland-row.

ASSISTANT MASTERS.

Patrick J. Curtin, L.R.C.S.I., &c., Coombe Hospital, and George Cole-Baker, M.B., B.Ch., B.A.O., Coombe Hospital, and 28 Lower Baggot-street.

DEPUTY MASTER.

Patrick J. Barry, L. & L.M., K. & Q.C.P.I., L.R.C.S.I., 50 Merrion-square.

PATHOLOGIST.

Edmond J. McWeeney, M.A., M.D., M.A.O., Pathologist to the Mater Misericordiæ Hospital.

CONSULTING OBSTETRIC SURGEON.

George H. Kidd, M.D., F.R.C.S., Ex-President of the Royal College of Surgeons in Ireland; Consulting Obstetric Surgeon to the Richmond, Whitworth, and Hardwicke Hospitals, &c., 58 Merrion-square, South.

THIS Hospital contains nearly Seventy Beds, and consists of Two Divisions—one of which is devoted to Lying-in Cases, and the other to the Treatment of Diseases Peculiar to Women.

The Maternity Department of this Hospital is the largest in Ireland, nearly 3,000 Cases being annually treated, either as Intern or Extern Patients.

Lectures are delivered in the Hospital, and Clinical Instruction is given daily at the bedside.

There is also a large Special Dispensary held daily, at which Clinical Instruction is given on the Diseases of Women and Children.

There is accommodation for a limited number of Intern Pupils, who enjoy exceptional advantages of acquiring a practical knowledge of Midwifery, and of the Disease-Peculiar to Women.

Two Resident "Pupil Midwifery Assistants" and one "Clinical Clerk" are elected half-yearly from among the Pupils of the Hospital.

Certificates of Attendance at this Hospital are accepted by all Licensing Bodies, and the Diploma is recognised by the Local Government and Army and Navy Boards as a full legal Midwifery qualification.

FEES.

Registration Fee, 10s. 6d., payable on entry.

Six Months' Course—Extern Pupils, Eight Guineas, half payable in advance, second half at the end of the first three months; Intern Pupils, Eighteen Guineas, One Month Four Guineas payable in advance. Examinations for the Diploma held monthly.

NURSES' FEES.

Six Months' Course—Extern, Six Guineas; Intern, Eighteen Guineas.

Students or Nurses can enter for attendance at any time.

Further particulars may be had on application to the Master or Registrar at the Hospital.

Rotunda Lying-in Hospital, DUBLIN.

Master:

WILLIAM J. SMYLY, M.D., F.R.C.P.

Consulting Physician—JAMES LITTLE, M.D., F.K.Q.C.P.

Assistant Physicians— J. H. GLENN, M.D., B.Ch., B.A.O., Univ. Dub.; J. HASTINGS TWEEDY, L.R.C.S.I., L.R.C.P.I.

Consulting Surgeon — Sir G. H. PORTER, Bart., D.L., J.P., M.D. (*Hon. Causâ*), F.R.C.S.I.

Extern Maternity Assistant — J. STANLEY DAVIES, M.A., M.B., C.M., Glasgow.

THIS INSTITUTION, the largest Lying-in Hospital in the United Kingdom, consists of two distinct Hospitals—namely, the Lying-in Hospital, into which 1,200 Labour Cases are on an average admitted annually, and the Auxiliary Hospital, set apart for the reception and treatment of patients suffering from the various forms of Uterine and Ovarian Disease; about 500 patients are received into this Hospital during each year.

There is also in connection with this Hospital a large Extern Maternity (1,838 patients were in the past year attended at their own homes), and a Dispensary for Diseases Peculiar to Women, which is open daily.

Pupils are admitted to the practice of all these departments.

Clinical Instruction in Midwifery and the Diseases of Women is given daily, and Lectures are delivered regularly during the Session on these subjects.

The DIPLOMA from this Hospital is granted to Pupils on their passing an Examination before the Master and Assistants, after a period of Six Months' attendance on the practice of the Hospital. It is recognised by the Local Government Board as a qualification in Midwifery for all Hospitals and Dispensaries under their control.

Accommodation is provided for a limited number of Intern Pupils.

Pupils can enter at any time.

TERMS OF ATTENDANCE.

Intern Pupils.		*Extern Pupils.*	
For Six Months, ...	£21 0 0	For Six Months, ...	£10 10 0
,, Three Months, ..	12 12 0	,, Three Months, ..	6 6 0
,, Two Months, ...	9 9 0		
,, One Month, ...	6 6 0		

Female Pupils are trained as Nursetenders and Midwives on the following terms:—

Intern Pupils for Six Months (including Board and Lodging), ... £25 5s.

Application to be made to the Master or Assistant Physicians, at the Hospital, Great Britain-street.

National Eye and Ear Infirmary.

(FOUNDED A.D. 1814.)

MOLESWORTH-STREET, DUBLIN.

Surgeons:

H. R. SWANZY, A.M., M.B., F.R.C.S.I., Ophthalmic Surgeon, Adelaide Hospital; Examiner in Ophthalmic Surgery to the Royal University in Ireland.

C. E. FITZGERALD, M.D., M.Ch., F.R.C.P.I.; Professor of Ophthalmic Surgery, Royal College of Surgeons; Surgeon Oculist-in-Ordinary to the Queen in Ireland.

Assistant Surgeons:

P. W. MAXWELL, M.D., C.M. Edin., L.R.C.P.I.; Ophthalmic Surgeon, Jervis-street Hospital; Examiner in Ophthalmic Surgery, Royal Colleges of Physicians and Surgeons in Ireland.

LOUIS WERNER, M.B., M.Ch., Ophthalmic Surgeon, Mater Misericordiæ Hospital; Examiner in Ophthalmic Surgery to the University of Dublin and to the Royal University in Ireland.

Junior Assistant Surgeon:

R. K. JOHNSTON, M.D., B.Ch.; Ophthalmic Surgeon, Dr. Steevens' Hospital.

Physician to the Throat Dispensary:

RICHARD A. HAYES, M.B., Physician to Dr. Steevens' Hospital.

THIS Hospital contains 30 beds for the Treatment of Eye Disease. The Out-Patient Department and Ophthalmoscope Room have been newly erected upon approved principles. Operations are performed daily at 12 o'clock. Clinical Instruction in Diseases of the Eye, including a systematic Course of Lectures, is given daily by the Surgeons at 11 a.m. Instruction in Diseases of the Ear is given at 10 a.m.

The Certificate of a Three Months' Course at this Hospital is recognised by the Licensing Bodies.

Fee for a Three Months' Course, with or without Certificate, £3 3s.

Practical Afternoon Classes for teaching the use of the Ophthalmoscope, &c., are formed from time to time by the Assistant Surgeons.

RICHMOND, WHITWORTH, & HARDWICKE HOSPITALS,
NORTH BRUNSWICK-STREET, DUBLIN.

PHYSICIANS :

SIR JOHN BANKS, K.C.B., M.D., LL.D., Physician-in-Ordinary to the Queen in Ireland; Regius Professor of Medicine, Univ. Dub.: Ex-President, College of Physicians; Member of the Senate of the Royal University of Ireland; Ex-President of the Academy of Medicine in Ireland, and of the British Medical Association.

S. GORDON, M.D.; Ex-President, College of Physicians; Ex-President of the Royal Academy of Medicine in Ireland; Physician to Swift's Hospital for Lunatics.

GUY P. L'ESTRANGE NUGENT, M.D.; Registrar, Royal College of Physicians; University Examiner in Clinical Medicine, Univ. Dub.

JOSEPH O'CARROLL, M.D., F.R.C.P.; Senior Demonstrator, Catholic University Medical School; Physician to the Children's Hospital, Temple-street; Examiner in Medicine, Royal University.

ASSISTANT PHYSICIAN AND PATHOLOGIST:

THOMAS DONNELLY, M.D., F.R.C.S.; Medical Officer, No. 1 Dispensary District.

CONSULTING OBSTETRIC SURGEON:

GEORGE H. KIDD, M.D.; President of the Royal Academy of Medicine; late Master of the Coombe Lying-in Hospital.

SURGEONS:

WILLIAM THOMSON, M.D., Ch.M.; Fellow, Examiner in Surgery, R.C.S.; General Secretary, Royal Academy of Medicine in Ireland; Member of the Senate of the Royal University in Ireland.

WM. THORNLEY STOKER, M.D.; Vice-President, R.C.S.; Fellow and Examiner in Surgery, Royal University; Surgeon to Swift's Hospital for Lunatics.

THOMAS MYLES, M.D., F.R.C.S.; Professor of Pathology and Member of Council, Royal College of Surgeons.

OPHTHALMIC SURGEON:

ARCHIBALD JACOB, M.D., F.R.C.S.; Professor of Ophthalmic Surgery in the Royal College of Surgeons, Ireland; and Secretary to the Council.

THROAT SURGEON:

ROBERT H. WOODS, M.B., B.Ch.; Demonstrator of Anatomy, Trinity College, Dublin.

CONSULTING OPHTHALMIC SURGEON:

C. E. FITZGERALD, M.D., F.R.C.P.; Oculist to the Queen in Ireland.

ASSISTANT SURGEON—J. WARBURTON WILKINSON, L.R.C.P. & S., Edin.

RESIDENT PHYSICIAN—SAMUEL MATHEWS, M.B., B.Ch., B.A.O., Univ. Dub.

RESIDENT SURGEON—W. H. LANGLEY, L.R.C.S., L.R.C.P.

The Course of Clinical Instruction will commence on Monday, OCTOBER 2nd, 1893.

DURING the past year, 1,733 patients were admitted; 22,576 out-patients were also treated; making in all 24,309 cases.

THE TRUSS ESTABLISHMENT, for the distribution of Trusses to the poor, is connected with these Hospitals.

FEVERS—There will be a distinct Course of Lectures and Clinical Instruction in Fevers.

OPERATIONS are performed on Monday, Wednesday, and Friday Mornings only, except in case of emergency.

OPHTHALMIC SURGERY—A Course of Practical Instruction in Ophthalmic Surgery will be given. Fee for the Certificate, Three Guineas.

A Resident Physician and a Resident Surgeon are appointed each year, and are paid for their services.

CLINICAL CLERKS.—Six Resident Clinical Clerks are appointed each half-year, and provided with furnished apartments, fuel, &c., &c. *These appointments are open not only to advanced Students as formerly, but also to those who are qualified in Medicine or Surgery.* The Dressers are selected from among the best qualified of the pupils, without the payment of any additional fee.

RICHMOND LUNATIC ASYLUM.—The Richmond Institution for the Insane, containing over 1,200 patients, adjoins these Hospitals, affording every facility for the study of mental diseases. A Three Months' Course of Clinical Instruction, as required for the Royal University, will commence on 1st of April. Fee, Three Guineas.

The Medical School of Trinity College, of the Royal College of Surgeons, and of the Catholic University, in which all the Courses of Lectures required by the different Colleges are delivered, are connected with these Hospitals through the Medical Staff.

HOURS OF ATTENDANCE.—The Hospitals are visited at Nine o'clock, a.m., daily, by the Physicians and Surgeons.

CLINICAL INSTRUCTION.—Two Clinical Lectures are delivered in each week, in addition to the usual Bedside Clinical Instruction which is given daily.

FEES.—For the Winter and Summer Session (nine months), £12 12s.; for the Six Winter Months, £8 8s.; for the Three Summer Months, £5 5s.

Students who take out their entire Clinical Course in these Hospitals are eligible for appointments as Resident Clinical Clerks without extra fee.

FEES FOR RESIDENT CLINICAL CLERKS, who have not taken out their full Clinical Course at these Hospitals:—Winter, 9 Months' Certificate (*if required*), £12 12s.; Six Months' Residence, £8 8s.; Summer, Three Months' Certificate (*if required*), £5 5s.; Six Months' Residence, £8 8s.; including furnished apartments, fuel, light, attendance, &c.

NOTE.—A Certificate of Six Months' Residence in Hospital as Clinical Clerk is accepted by the Royal College of Surgeons as equivalent to Nine Months' attendance as an Out-door Pupil.

For Prospectuses apply to—

W. THOMSON, F.R.C.S., Treasurer, 54 Stephen's-Green, East; or to GUY P. NUGENT, M.D., Hon Sec., 19 Lr. Fitzwilliam-street, Dublin.

CITY OF DUBLIN HOSPITAL, UPPER BAGGOT-STREET.

Founded 1832. Rebuilt and Enlarged 1893.

SESSION, 1893-4.

PHYSICIANS:—**Hawtrey Benson,** B.A., M.D., Univ. Dublin; F.R.C.P.I.; late Extern Examiner in Clinical Medicine, Trinity College, Dublin; late Censor and Clinical Examiner, Royal College of Physicians; Consulting Physician for Ireland to Her Majesty's Colonial Office.

George F. Duffey, B.A., M.D., Univ. Dubl.; F.R.C.P.I.; Professor of Materia Medica, and Professor of Pharmacy, R.C.S.I.; Visitor for H. M. Privy Council of the Examinations of the Pharmaceutical Society of Ireland; Inspector of Examinations for the General Medical Council; late Censor and Examiner, R.C.P.I., and Trinity College, Dublin.

SURGEONS:—**Henry Gray Croly,** F.R.C.S., Member of the Royal College of Physicians; Ex-President of the Royal College of Surgeons; Ex-President of the Surgical Section of the Royal Academy of Medicine; Consulting Surgeon to the Monkstown Hospital; Past President, Irish Medical Association; for many years Member of the Court of Surgical Examiners, and Examiner in Anatomy, Surgery, and Operative Surgery.

William I. Wheeler, F.R.C.S., B.A., M.D., and Master of Surgery, Univ. Dubl.; Member of the Royal College of Physicians; Member of Council and Past President, Royal College of Surgeons; Past President of the Surgical Section of the Royal Academy of Medicine; formerly Member of Surgical Court of Examiners, and Examiner in Surgery and Operative Surgery, Royal College of Surgeons; Consulting Surgeon to the National Lying-in Hospital, and to the National Institution for the Blind in Ireland.

Henry Fitzgibbon, B.A., M.D., Master in Surgery, Univ. Dub.; Member of the Royal College of Physicians, Ireland; F.R.C.S.I.; Past-President of Royal College of Surgeons of Ireland, and Member of Council; Senior Surgeon to the Government Lock Hospital; Consulting Surgeon to St. John's House of Rest; Principal Medical Officer to the Post Office in Ireland; Medical Visitor in Lunacy under the Court of Chancery; Fellow of the Royal Academy of Medicine of Ireland.

OPHTHALMIC AND AURAL SURGEON:—**Arthur H. Benson,** F.R.C.S., M.A., Univ. Dubl.; Junior Surgeon and Lecturer in Clinical Ophthalmology, St Mark's Ophthalmic Hospital; Examiner in Ophthalmic and Aural Surgery, Conjoint Examinations, Royal College of Surgeons; and Royal College of Physicians; Ex-Lecturer in Ophthalmology, Ledwich School of Medicine, Ex-University Examiner in Ophthalmic Surgery, Trinity College, Dublin.

GYNÆCOLOGIST:—**John Lilly Lane,** A.B., Trin.Coll.Dub.; L.R.C.S.I.; L. and L.M.R.C.P.I.; Ex-Assistant Physician, Rotunda Hospital; Maternity Physician, Steevens' Hospital; Fellow and Member of Council, Obstetrical Section, Royal Academy of Medicine.

TEMPORARY SURGEON:—**Humphrey J. Broomfield,** F.R.C.S.I., L.R.C.P.I., L.M.; College Anatomist, and Member of Council, Royal College of Surgeons; President of Anatomical and Physiological Section, Royal Academy of Medicine, Ireland; Member of Anatomical Society, Great Britain; Lecturer on Anatomy, late Carmichael College of Medicine.

PATHOLOGIST AND TEMPORARY ASSISTANT PHYSICIAN:—**William R. Graves,** L. & L.M., R.C.P.I., & L.R.C.S.I.; Pathologist to St. Mark's Ophthalmic Hospital; Anæsthetist to the Dental Hospital; Fellow of the Academy of Medicine; Hon. Member, British Institute of Public Health; Hon. Memb., British Dental Assoc.; Consulting Physician to Home for Destitute Children, Eccles-street.

HOUSE SURGEON:—**Henry Moore,** L.R.C.S.I., L. and L.M., R.C.P.I.

CONSULTING PHYSICIAN:—**Sir John T. Banks,** K.C.B., M.D.; Regius Professor of Physic, Univ. Dublin; Physician-in-Ordinary to the Queen in Ireland; Past President of the Royal Academy of Medicine in Ireland.

THE arrangements of this Hospital offer Pupils opportunity of observing disease in every form. At the morning visit, which commences at Nine o'clock daily, the nature, treatment, and progress of each case is explained at the bedside of the patient. Clinical Lectures are delivered weekly on the most important cases under treatment, and Pathological specimens are exhibited. Surgical operations admitting of delay are performed on Tuesdays and Thursdays, at 10 a.m., and notice of operations, in cases of emergency, given to the Students.

The DRUMMOND WING, for Fever and other Contagious Diseases, affords the fullest opportunity for studying these important branches of Medicine, and is visited each morning by the Physician on duty.

There are Special Wards for Ophthalmic and Aural cases, under the care of Mr. ARTHUR BENSON, who delivers a Course of Lectures on Diseases of the Eye and Ear, including Operations and Ophthalmoscopic Instruction.

There is a Special Ward for Diseases of Women, under the care of Dr. LANE, who will give Clinical Instruction, and a course of Lectures, on Diseases peculiar to Women. There is also a Ward exclusively for Children, affording ample opportunities of studying the diseases of early life.

Connected with the Hospital is a largely-attended Daily Dispensary, at which the Pupils are allowed to perform minor operations under the guidance of the Surgeons; and are rendered familiar with the details of Dispensary Management, and the art of prescribing. There are Special Dispensaries for Diseases of the Skin and Throat, for the Eye and Ear, and for Diseases peculiar to Women, at which Clinical Instruction is given. Surgical appliances of all kinds are made the subject of careful instruction.

Dressers to the Surgeons and Clinical Clerks to the Physicians are appointed, and Certificates awarded for the satisfactory performance of their duties.

A salaried House Surgeon is appointed annually. Resident Surgical and Medical Pupils are appointed every Six Months, and Special Certificates are awarded if merited.

The WINTER SESSION commences 1st OCTOBER, and terminates on MARCH 31. The SUMMER SESSION commences on APRIL 1, and terminates on JUNE 30.

FEES.—Nine Months' Hospital Attendance, £12 12s.; Six Months, £8 8s.; Three Months, £5 5s. Certificates of Attendance are recognised by all the Universities, Colleges, and Halls, and by the Army, Navy, and other Examining Boards. For further particulars apply to Mr. ARTHUR BENSON, F.R.C.S., 42 Fitzwilliam-square, or at the Hospital, between Ten and Eleven o'clock, a.m.

Meath Hospital and County Dublin Infirmary.

PHYSICIANS:

JOHN WILLIAM MOORE, M.D., Univ. Dubl.; Vice-President, Fellow and Censor, Royal College of Physicians; Professor of Practice of Medicine, Royal College of Surgeons, Ireland; Diplomate in State Medicine, Trinity College, Dublin.

JAMES CRAIG, M.D., Univ. Dubl.; F.R.C.P.I.; Assistant-Physician, National Children's Hospital; Demonstrator of Anatomy, R.C.S.I.

SURGEONS:

Sir GEORGE H. PORTER, Bart., M.D., M.Ch. (*Honoris Causâ*), Univ. Dub., LL.D., (*Honoris Causâ*) Glasgow; F.R.C.S.I; Surgeon-in-Ordinary to the Queen in Ireland; Regius Professor of Surgery in the University of Dublin; Surgeon to Simpson's Hospital; Consulting Surgeon to Sir P. Dun's Hospital, Dr. Steevens's Hospital, Rotunda Hospital, Coombe Lying-in Hospital, St. Mark's Ophthalmic Hospital, and National Children's Hospital.

Sir PHILIP CRAMPTON SMYLY, M.D., Univ. Dubl.; F.R.C.S.I., M.R.C.P.I.; Representative on the General Medical Council for the Royal College of Surgeons, Ireland.

LAMBERT H. ORMSBY, F.R.C.S., M.D., Univ. Dubl.; Surgeon to the National Children's Hospital; Ex-Member of the Surgical Court of Examiners, R.C.S.I.

W. J. HEPBURN, F.R.C.S.E.; L.R.C.P.I.; L.R.C.P.E.

Sir WILLIAM STOKES, M.D., Ch.M., F.R.C.S.; Surgeon-in-Ordinary to Her Majesty in Ireland; Professor and Examiner in Surgery, Royal College of Surgeons; Examiner in Surgery, University of Oxford; late Senior Surgeon to the Richmond Surgical Hospital; Consulting Surgeon to the Dental Hospital of Ireland.

EDWARD EMANUEL LENNON, F.R.C.P.I.; Additional Examiner in Medicine, Royal College of Physicians.

Clinical Assistant—EDWARD E. LENNON, F.R.C.P.I.

Resident Surgeon—ALFRED J. POWER, L.R.C.S.I., L.R.C.P.I.

THE WINTER SESSION of 1893–94 will commence on the 2nd of OCTOBER, During the first three months a Course of Lectures will be delivered on **Saturdays**, commencing at 11 o'clock, a.m., on **Instruments and Surgical Appliances**, by Mr. ORMSBY. These Lectures have been specially arranged for first year's Hospital Students. The Course of Clinical Lectures will be inaugurated by an Introductory Address, to be delivered by Dr. JAMES CRAIG, on Monday, 2nd October, 1893.

The Hospital contains 150 beds for the reception of Surgical, Medical, Febrile, and Infantile Diseases, besides two additional Medical and Surgical Wards (in John Barber Wing) recently opened, which much increases the facilities for Clinical Instruction.

The Physicians and Surgeons on duty will visit the Hospital at Nine o'clock, a.m., on alternate days, so as to allow the Members of the Class to be in attendance at their respective Schools of Medicine at Eleven o'clock, a.m. Medical and Surgical Clinical Lectures will be delivered in the Theatre, and Instruction in Medicine and Surgery will be given at the bedside on alternate days.

Special Wards have been set apart for the reception of Children. In these Wards the Pupils will have the opportunity of studying that highly important subject—Diseases of Children.

There is an extensive Extern Department, including a Dispensary, in which the minor operations of Surgery are taught under the supervision of the Surgeon on duty.

Certificates of Attendance at this Hospital are recognised by all the Licensing Bodies in the United Kingdom. Prizes will be given at the termination of the Winter Course to the best answerers in their respective classes.

Two Clinical Assistants—a Senior and a Junior—and a House Surgeon are selected from fully qualified Pupils of the Hospital, and appointed by the Medical Board at their last meeting in July of each year. The out-going Officers shall be eligible for re-election.

Four Medical Clinical Clerks and Eight Surgical Resident Pupils are appointed annually. These offices are open to Pupils as well as to Apprentices.

The Hospital is within a few minutes' walk of the University of Dublin, the Royal College of Surgeons, the Royal University of Ireland, and Cecilia-street School of Medicine.

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BOOKS, PAMPHLETS, AND PERIODICALS RECEIVED—OCT., 1893.

1. A Handbook of Local Therapeutics. Edited by Harrison Allen, M.D. London: H. K. Lewis. 1893. 8vo. Pp. 505.

2. A Handbook of Obstetric and Gynæcological Nursing. by the late Fleetwood Churchill, M.D. Revised and greatly enlarged. By Thomas More Madden, M.D., F.R.C.S. Ed. Dublin: Fannin & Co. 1893. Crown 8vo. Pp. 216.

3. The Value of Hypnotism. By Thos. Crisfield, masseur, &c. London: Eyre & Spottiswoode. 1893. Pp. 39.

4. Warum sind harnsaure Nierensteine und der Harngries so viel leichter löslich als Gichtablagerungen? Von Dr. Mordhorst in Wiesbaden. Reprint. 1893. Pp. 5.

5. Six Months' Medical Evidence in the Coroner's Court of Montreal. By Wyatt Johnston, M.D., and George Villeneuve, M.D. Montreal. Reprint. 1893. Pp. 22.

6. On the Nature and Treatment of Talipes Equino-Varus, or Club-Foot. By Bernard E. Brodhurst, F.R.C.S. London: J. & A. Churchill. 1893. 8vo. Pp. 61.

7. Unilateral Hypertrophy of the Face. By D. W. Montgomery, M.D. 1893. Reprint. Pp. 13.

8. Punctured Wounds of the Feet. By S. C. Plummer, A.M., M.D. Chicago. 1893. Reprint. Pp. 8.

9. Revue Générale de Médecine, de Chirurgie, et d'Obstetrique. Deuxième Année. Nos. 35, 36, 37, 38. Paris: O. Doin.

10. Guy's Hospital Reports. Vol. XLIX. London: J. & A. Churchill. 1893. 8vo. Pp. cxxiii.–505.

11. Further Report and Papers on Epidemic Influenza, 1889-92. With an Introduction by the Medical Officer of the Local Government Board. London: Eyre & Spottiswoode. 1893. 8vo. Pp. xi.–154.

12. The Medical Magazine. Vol. II., No. 3. September, 1893. London: Southwood, Smith & Co.

13. The Post-Graduate. Vol. VIII., Nos. 8 & 9. August and September, 1893. New York.

14. Haben wir einen Ferntastsinn? Von Georg Hirth. München.

15. The Health-Resorts of the Canary Islands in their Climatological and Medical Aspects. By J. Cleasby Taylor, M.D. Edin., M.R.C.S. Lond. London: J. & A. Churchill. 1893. 8vo. Pp. 95.

16. Brown's "South Africa." London: Sampson Low, Marston & Co. 1893. 8vo. Pp. 245.

17. The Diseases of Childhood (Medical). By H. Bryan Donkin, M.D.Oxon., F.R.C.P, London: Charles Griffin & Co. 1893. 8vo. Pp. 433.

18. On Diseases of the Lungs and Pleuræ, including Consumption. By R. Douglas Powell, M.D. Lond. Fourth Edition. London: H. K. Lewis. 1893. 8vo. Pp. 600.

19. Vegliamo! Considerazioni intorno alla Profilassi e Cura del Colera vero. Par Michele Mauro. Trani: V. Vecchi e C. 1893. Pp. 29.

20. Anæsthetics and their Administration: A Practical Handbook for Medical and Dental Practitioners and Students. By Frederic Hewitt, M.A., M.D.; Anæsthetist and Instructor in Anæsthetics, London Hospital; Chloroformist and Lecturer on Anæsthetics, Charing Cross Hospital; Anæsthetist, Dental Hospital, London; and National Orthopædic Hospital, &c., &c. London: Charles Griffin & Co. 1893. Crown 8vo. Pp.

21. The Cholera Epidemic of 1892 in the Russian Empire. By Frank Clemow, M.D. Edin. London: Longmans, Green & Co. 1893. 8vo. Pp. 123.

22. The Diseases of the Male Organs of Generation. By W. H. A. Jacobson, M.Ch. Oxon., F.R.C.S. London: J. & A. Churchill. 1893. 8vo. Pp. 766.

23. Ueber Trional. Von Dr. Beyer. Berlin. 1893. Reprint. Pp. 4.

24. Report on the Health of Bolton during the Year 1892. By Frederick E. Adams, M.D., M.Ch., D.P.H. Camb., F.C.S. Bolton: Tillotson & Son. 1893. Pp. 49.

25. Circumcision: its advantages and how to perform it. By M. Clifford, L.R.C.P. Lond. London: J. & A. Churchill. 1893. 8vo. Pp. 23.

26. St. Thomas's Hospital Reports. New Series. Vol. XXI. London: J. & A. Churchill. 1893. 8vo. Pp. 535.

27. Sciatic Neuritis: its Pathology and Treatment. By Robert Simpson, L.R.C.P., L.R.C.S. Bristol: John Wright & Co. 1893. Pp. 46.

28. Diseases and Injuries of the Teeth, including Pathology and Treatment. By Morton Smale, M.R.C.S., L.S.A., L.D.S., and J. F. Colyer, L.R.C.P., M.R.C.S., L.D.S. London: Longmans, Green & Co. 1893. 8vo. Pp. 423.

29. The Clinical Use of Prisms; and the Decentering of Lenses. By Ernest E. Maddox, M.D. Bristol: John Wright & Co. 1893. Second Edition. 8vo. Pp. 170.

30. New South Wales. Report of Board appointed to inquire into the Prevalence and Prevention of Lead Poisoning at the Broken Hill Silver-Lead Mines. Sydney: Charles Potter. 1893. 4to. Pp. 120.

31. Abnormal Man. By Arthur MacDonald. Washington: Bureau of Education. Circular of Information, No. 4. 1893. 8vo. Pp. 445.

32. The Essentials of Chemical Physiology. By W. D. Halliburton, M.D., F.R.S. London: Longmans, Green & Co. 1893. 8vo. Pp. 166.

33. The Indian Medico-Chirurgical Review. Vol. I., No. 8. August, 1893. Bombay: N. K. Rao & Co.

34. The Journal of the British Dental Association. Vol. XIV., No. 9. September 15, 1893. London: Baillière, Tindall, & Cox.

35. The Australian Medical Journal. Vol. XV., No. 6. June 15, 1893. Melbourne: Stillwell & Co.

36. Blätter für klinische Hydrotherapie. III. Jahrgang. Nr. 9. Wien. September, 1893.

37. Annales de la Policlinique de Bordeaux. Tome III., Fasc. 2. No. 16. Septembre, 1893. Bordeaux: Feret et fils.

38. The Stœchiological Cure of Consumption and Diseases of the Respiratory Organs. By John Francis Churchill, M.D. Third Edition. London: David Stott. 1893. Pp. 38.

39. Przeglad Chirurgiczny. Tom I. Warszawa. 1893.

40. Sanitary Work in the Smaller Towns and in Villages. By Charles Slagg, Assoc. M. Inst. C.E. Third Edition. London: Crosby, Lockwood, & Son. 1893. 8vo. Pp. 270.

41. A Manual of Medical Treatment, or Clinical Therapeutics. By I. Burney Yeo, M.D., F.R.C.P. London: Cassells & Co. 1893. Vol. I., pp. 631 Vol. II., pp. 744.

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THE DUBLIN JOURNAL

OF

MEDICAL SCIENCE.

OCTOBER 2, 1893.

PART I.

ORIGINAL COMMUNICATIONS.

ART. IX.—*Adenoma of the Kidney in the Adult.*[a] By CONOLLY NORMAN, F.R.C.P.I.; Medical Superintendent, Dublin District Asylum.

THE comparative rarity of the specimen which I present forms my reason for exhibiting it, since I do not think I have any new light to throw upon the origin of the condition presented. I cannot find any mention of a similar case in the long records of the Dublin Pathological Society, the parent of this Section, nor do the Transactions of the Pathological Society, London, contain any satisfactory description of the affection here dealt with. The English treatises on diseases of the kidney merely mention adenoma in the briefest and most casual way as a rare form of tumuor in that organ.

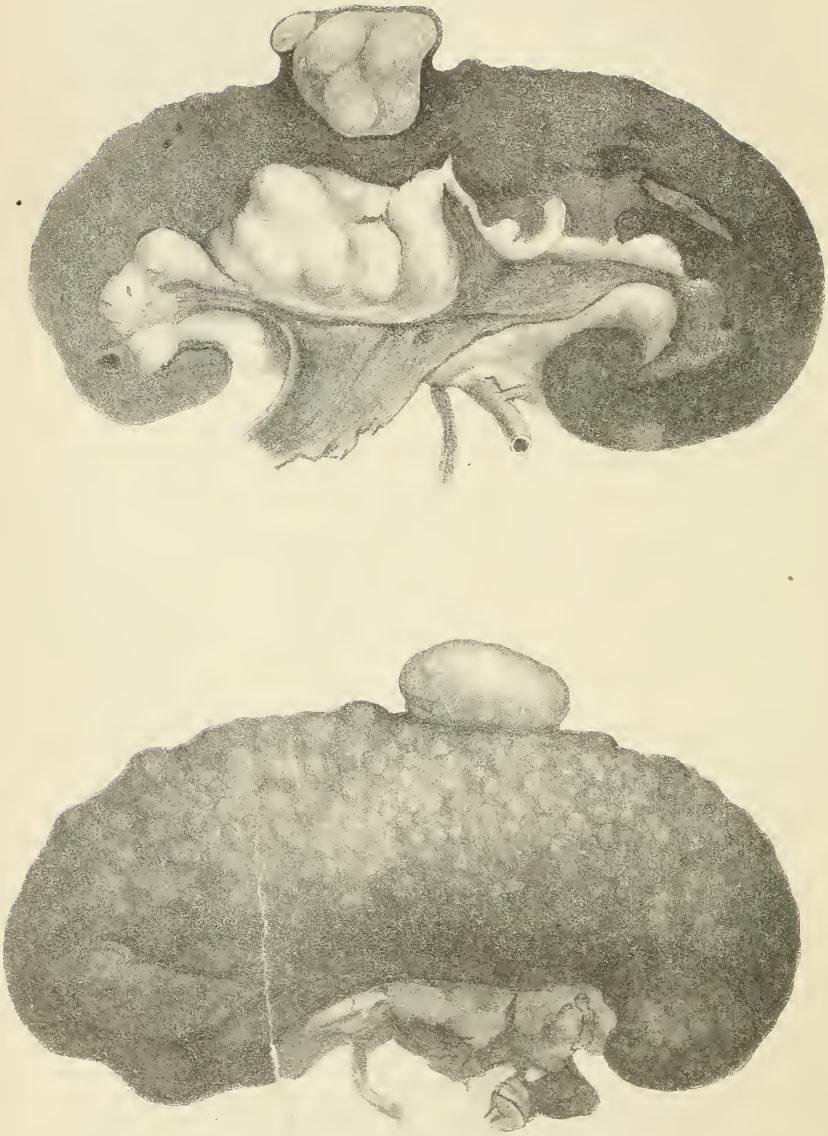
CASE.—The patient, in whom was found the growth about to be exhibited, was a man, fifty-three years of age, who died in the Richmond (Dublin District) Asylum in April, 1892. He had been an inmate of the Asylum for two months. There was absolutely no history of his previous life, save what is contained in the facts that he had been a soldier and had served in India. He admitted to rather intemperate habits. He had a stricture about the junction of the membranous and prostatic portions of the urethra, which gave him little trouble, and readily per-

[a] Read before the Section of Pathology of the Royal Academy of Medicine in Ireland, on Friday, December 2, 1892.

mitted the passage of No. 5 catheter. He presented a slight degree of general anasarca. His superficial arteries were tortuous and rigid. Mentally he suffered from chronic paranoia with persecutory delusions. His general condition was feeble throughout. The immediate apparent cause of death was a sharp attack of diarrhœa, which came on about a week before the end and proved intractable.

Post-mortem.—The body exhibited slight general anasarca. The brain showed signs of chronic wasting, thickened pia, and wasted convolutions. The arteries of the circle of Willis were extensively atheromatous. The left pleural cavity contained about eight ounces of clear fluid, the right was contracted by old adhesions. The pericardium contained a slight excess of fluid. The heart was enlarged, particularly the left side, and the left ventricular wall was much thickened. The aorta presented numerous atheromatous patches. The liver was of average size and consistence, and showed to the naked eye no sign of cirrhotic change. The ileum presented scattered patches of engorgement, and the large intestines were pretty uniformly injected. There was no ulceration. The lower bowel contained a quantity of ropy mucus. An old stricture existed at the junction of the membranous and prostatic portions of the urethra. The bladder wall was much thickened, rugose, and contracted. The summits of the rugæ were covered with a thin layer of a whitish, gritty material, easily washed off with a stream of water. The ureters were dilated but not tortuous, and their walls were thickened. The left kidney was diminutive, its greatest diameter on vertical section being 7 centimetres ($2\frac{3}{4}$ inches). The pelvis was relatively dilated. It was impossible with the naked eye to distinguish between cortex and medulla, the colour being uniform, and the projection of the pyramids being absent. The substance representing cortex and medulla varied in thickness from 2 to 7 millimetres—in other words, was little over $\frac{1}{4}$ of an inch at its thickest part. It presented on section numerous pouting vessels with manifestly thickened walls. The external surface of the organ was irregularly nodulated. Under the microscope, sections exhibited in marked degree the ordinary appearances of chronic interstitial nephritis. Nevertheless, it is singular to observe that, notwithstanding the extreme degree of atrophy, even the narrowest portions showed numerous tubules and some glomeruli that differed little from the normal, and there were nowhere considerable tracts of tissue that had lost all semblance of glandular structure such as one not unfrequently sees in kidneys much less wasted.

The right kidney was also contracted, though in a far less degree than the left. It measured in vertical diameter 10·8 centimetres ($4\frac{1}{4}$ inches.) The cortex was much wasted. In colour and apparent structure, the cortex and medulla were not readily distinguishable. The pelvic fat was abundant. Section showed numerous patulous vessels with thick walls. The external surface was pretty uniformly "granular."



ADENOMA OF KIDNEY.

F Huth, Lith^r Edin^r

In this kidney a new growth existed. It projected 9 millimetres from the convex exterior border of the kidney, just below the middle of that surface. Externally it was closely covered by the capsule of the kidney, wherein, in this position, ran a great number of vessels—some encircling the base, others running over the surface of the growth. The tumour from the outside showed an expansion above the base, thus approaching to the pedunculated form.

The surface of the new growth was nodular. It was of a lighter colour than the rest of the kidney. When the capsule of the kidney was removed, which adhered closely to the tumour, the latter showed a dirty white tint.

On section the tumour was seen to project into the substance of the kidney for about the same distance as it projected beyond the surface of the organ. The accompanying plate shows the relative proportions accurately, but as the drawing was made after the specimen had been hardened, there is a slight uniform diminution in size.[a] The tumour was marked off from the kidney structure by a thin fibrous-looking dark coloured capsule, from which thicker bands extended into the new growth. In these dissepiments the openings of minute vessels were here and there distinguishable. On the projecting surface of the tumour, this fibrous structure seemed to become continuous with the thickened capsule of the kidney.

Examined microscopically, the right kidney presented the typical appearances of the chronic cirrhotic kidney—"granulations of Bright" separated by atrophic bands, containing proliferated connective tissue and small celled infiltration. In the granulations the uriniferous tubules had generally become considerably dilated. The glomeruli, in many cases, presented great thickening of the capsule by a concentrically arranged fibrous-looking connective tissue containing nuclei. The interior of the glomerulus often showed a granular deposit or exudation containing a few nuclei. Here and there glomeruli had undergone colloid degeneration. Many of the tubuli contorti had lost their epithelium, in others the epithelium was much degenerated, and some had undergone colloid change. The arterial walls were much thickened, all the coats being involved. Around the portion of the tumour which lay within the kidney substance, there was a zone of atrophic tissue infiltrated with small cells and containing highly degenerated tubuli and glomeruli, many of which exhibited colloid change. In this zone there were many thickened vessels and a great number of blood extravasations.

Between the kidney structure and the tumour lay a distinct band of connective tissue, thicker in some parts than in others, but nowhere interrupted. It consisted of wavy fibres with scattered elongated oat or rod-

[a] The plate fairly represents the naked-eye appearances of the kidney and tumour, but the lumpy and projecting aspect given to the section of tumour and to the pelvic fat is incorrect.

shaped nuclei. This proper capsule of the tumour sent out bands which were gradually lost in the connective tissue of the degenerated kidney substance, and from this capsule trabeculæ passed into the tumour. These trabeculæ broke up rapidly into very fine bands, enclosing alveoli of pretty uniform size. The larger trabeculæ contained numerous large thin-walled vessels and many vascular dilatations, resembling, as Sabourin says, the sinuses of a cavernous angioma. The smaller trabeculæ consisted of connective tissue of great delicacy provided with few nuclei, and contained vessels which seemed to be destitute of a proper wall as well as sinuses similar to those described. The walls of the alveoli were of extreme tenuity, and I failed to make out anywhere a membrana propria like that of the uriniferous tubules. Sections of the tumour, which had been hardened in Müller's fluid, having been stained and mounted in glycerine, revealed, though imperfectly, the condition above described and little else. The inter-alveolar structure was obscured by an enormous accumulation of highly refractive fat globules and fat crystals. Treatment with ether, or absolute alcohol and clove oil, removed most of the fat, and enabled one to recognise the structure of the preparations more perfectly. One then found that the alveoli were lined with large epithelial cells, mostly of the cylindrical type, containing a faintly staining protoplasm indistinctly granular, and towards the base of the cell a nucleus which stained well and sometimes presented a distinct nucleolus. Some of the alveoli strongly resembled uriniferous tubules, presenting in long section a distinct lumen bordered on each side by a row of cylindrical cells, and occasionally one got such a tube in cross section with a lumen surrounded by a circle of cells. In other places the structure was less distinct, and the cells seemed to fill up the alveoli, leaving no lumen. Some of the alveoli contained several layers of cells, and in these the form commonly approached that of cubical epithelium, especially in the layers remote from the alveolar wall. In many alveoli there was a broadening at either end and a narrowing between, which appeared to be caused by the tube being bent upon itself, and recalled the appearance familiar in the dilated tubuli contorti of a Bright's granulation. Very frequently the alveoli which bordered the capsule of the growth or one of the larger trabeculæ, presented on section a fusiform shape, suggesting that a tube forming a segment of a large circle had been cut tangentially. Towards the centre of the lobules of the growth the structure became more confused, the alveoli looked less regular, the cells were smaller and more irregular in outline, and seemed more tightly packed. Throughout the alveolar mass there were numerous hæmorrhages. In some places blood corpuscles seemed to have found their way between the rows of cells into the lumen of a tube, and were contained within a double row of cells which still retained the appearance of epithelial cells. In others the circumjacent structures had been torn up by hæmorrhages. Very often among the alveoli, and not apparently

connected with the vessel-bearing trabeculæ, there were relatively large and densely packed masses of blood corpuscles surrounded by a single row of very delicate, flat, nucleated cells, and without any other wall. Throughout were numerous cavities which had contained blood, and to which a few blood corpuscles still adhered—some were mere holes surrounded by broken down epithelial cells, others were cavities lined as above described. I did not find any non-hæmorrhagic cysts, apparently derived from a dilatation of the alveoli, and comparable to the cysts in interstitial nephritis, such as have been described by Sabourin.

The sections exhibited under the microscopes show the various appearances described respectively in the left and right kidney, and in the different portions of the tumour.

As to the exact nature of tumours of the kidney in the adult of the character above described there has been some difference of opinion. Waldeyer, to whom Sabourin gives the credit of being the first to describe the condition, regarded it (Virchow's Archiv., B. 41. Ueber die Entwicklung der Carcinome) as being a variety of carcinoma which has undergone a sort of arrest of development. Two years later Klebs, in an early edition of his Handbook of Pathological Anatomy, recognised these growths under the names of adeno-carcinomata and adenomata of the kidney. The most exhaustive of the earlier works is that of Sturm (Ueber das Adenom der Niere, u.s.w. Archiv. der Heilkunde, 1875). Sturm held that these tumours, which he called adenomata, arose through a proliferation of the epithelium of the convoluted tubules. His descriptions are minute and accurate.

Later, Sabourin, of Paris, published a series of exceedingly able monographs on this subject, of which the first appeared in 1882.[a] He has collected a large number of cases, and his descriptions leave nothing unsaid. He tells us that these tumours are generally small, sometimes very small, yet at times attaining the size of a hazelnut, walnut, or even hen's egg. They are usually situated in the cortex, immediately under the capsule which extends over them. Mostly they are single and confined to one kidney, but they may occur in both, and "in certain cases, indeed, the surfaces of the cirrhotic

[a] Contribution a l'étude de la cirrhose rénale. Étude sur quelques variétés de tumeurs du rein. Archiv. de Physiologie. T. IX. 1882.

Sur quelques cas de cirrhose rénale avec adénomes multiples. Revue de Médécine. T. IV. 1884.

Les adénomes hæmorrhagiques du rein. *Ibid.*

Adénome volumineux du rein ayant donné lieu à la production de nodules secondaires dans le poumon. Sabourin et Oettinger. Rev. de Médécine. T. V. 1885.

kidneys are so to say sprinkled all over with them." Sabourin considers that the renal adenomata are "lesions of which the history ought not to be separated from that of cirrhosis of the kidney," that they are, in fact, an accident of renal cirrhosis. In all recorded cases they appear to have been associated with that condition. Sabourin holds with Sturm that adenomata arises through a proliferation of the epithelium of the tubuli contorti. He divides them into two classes—(1) tumours having epithelial cells of the cylindrical type, and (2) having cells of the cubical type. These are stated by Orth to correspond to the two divisions of renal adenomata made by Weichselbaum and Greenish (Wiener Med. Jahrb., 1883)—namely, alveolar and papillary. W. and G. believe that the alveolar variety arises in the convoluted tubules, and the papillary in the collecting tubules. The cubical-celled variety has a tendency to form, in the interior of wide cavities lined with cubical epithelium, elevations of a lamelliform or papillary character, sometimes branching out into arborescent forms of a highly compound nature.

Sabourin, however, believes that both the cylindrical and the cubical-celled arise from the convoluted tubes, and he thinks that the difference between them results from the fact that the former originate where the epithelium is still cylindrical, and the latter where degeneration has advanced further, and the epithelium has become cubical. The first variety begins, says Sabourin, in the comparatively healthy epithelium in the midst of a granulation of Bright, and it tends to limit itself and become encysted by rapidly invading the entire granulation, and being arrested by the contracting connective tissue which bounds the granulation. On the other hand, the cubical-celled variety originates amidst the fibrous portions of the contracted kidney where the degenerated epithelium has assumed the cubical form. It is often imperfectly encapsuled. With regard to the formation of the alveoli, Sabourin believes that the new growth begins in either form by proliferation of the epithelial cells covering connective tissue lamelli protruding into the cavity of a dilated tubule. These lamellæ branch again and again, and eventually the twigs become united at their various extremities, the connective tissue becoming rapidly thinned out into delicate fibres, and thus the appearance of alveoli and tubules is produced. According to this view, such a tumour as that which I have described would be a growth of considerable age, while the papillary growths would be younger conditions.

Sabourin traces an analogy between renal adenomata in the two varieties which he describes, and kindred adenomatous degenerations in the liver. The cylindrical-celled renal adenomata are of the same nature as the growths called *hepatic polyadenomata* by Kelsch and Kiener (Archives de Physiologie, 1876); the cubical-celled correspond to the *biliary polyadenomata* of the same authors. The analogy is obvious, but it would lead us too far afield to consider it in detail. Sabourin argues that his cases constitute a special class of new growths in the kidney, because they coincide with cirrhosis of the kidney, and result from a quite local process, and appear to have a constant tendency to become encysted.

Grawitz, in an article on "The So-called Lipoma of the Kidney," in the ninety-third vol. of Virchow's Archiv., 1883, maintains that while the growths showing branched lamelliform papillæ may originate from the epithelium of the uriniferous tubules, the tubular (alveolar) growths, such as the one which I describe, have entirely a different origin. He believes that they arise from the proliferation of embryonic fragments of displaced adrenal tissue. It is well known that accessory adrenals are common, and that fragments of displaced adrenal tissue are occasionally attached to the kidney. Orth points out, indeed, that such fragments may be found anywhere between the supra-renal capsules and the generative glands, and seeks a reason for this in the close proximity of the two organs before the descent of the latter (Lehrbuch der speciellen pathologischen Anatomie, B. II., s. 3.) These fragments consist almost exclusively of cortical supra-renal substance, and always exhibit the characteristic loading with fat. Now Grawitz believes that in an early stage of the development of the kidney, fragments of adrenal tissue, transported from their normal position, come into contact with the kidney, and lie between two renculi. The latter developing close in the aberrant growth, while the common capsule of the kidney grows over it. Thus are accounted for the fibrous covering of the tumour, its adenoid structure, and the fatty degeneration which it shows. As a matter of fact, it seems that Grawitz chiefly bases his views on this fatty change. This appears rather whimsical unless it is made appear why this fatty degeneration should be confined to the cortical tissue of the adrenals. Grawitz also objects to Sabourin's view that the epithelial tissue of the tubuli contorti having begun to degenerate, and having become cubical, can then actively proliferate. Here the analogy of the two classes of growths in

the liver, described by Kelsch and Kiener, may, perhaps, support Sabourin, but if one adopts the view of Weichselbaum and Greenish above referred to, this difficulty does not arise.

Against Grawitz' views, and in favour of Sabourin's general interpretation of these conditions, are the following facts:—

1. Adenoma in either form in the adult, is always associated with renal cirrhosis.

2. Though the tendency is towards encystment, there is not always a capsule. In one of Sabourin's cases the capsule was absent, and though the growth was mostly alveolar, part was papillary. Here Sabourin demonstrated also a gradual transition from tubuli contorti to adenomatous tissue.

3. In some other cases recorded by Sabourin the types were mixed. In portions of the growth tubules with cylindrical epithelium occurred, in part loculi filled up with compound papillæ.

These facts are to be expected either on Sabourin's or Weichselbaum and Greenish's theory, but are unaccountable on Grawitz'.

4. Finally, the cubical-celled and papillary growths are characterised, as Sabourin's cases show, by the identical same tendency to fatty change which Grawitz claims as being characteristic of the alveolar varieties (supra-renal according to him), which he proposes to call "strumæ supra-renales lipomatodes aberratæ."[a]

On the whole, then, I believe that I am justified in calling the growth now exhibited an adenoma of the cylindrical-celled type of Sabourin or of the alveolar variety of Weichselbaum and Greenish. The appearances presented are identical with those which will be found described at greater length and with much ability in the first four cases by Sabourin in his first paper.

Two points of interest not directly arising out of my case may be referred to. The tendency to extensive hæmorrhage in these tumours is great, as might be expected from their structure. In a case described by Grawitz, an enormous hæmorrhagic cyst was formed, and extravasation may have been the immediate cause of death. The subject has received the attention of Sabourin in a paper above referred to.

There seems to be a tendency to the development of carcinoma in these growths. In Grawitz' case there was secondary infiltration of the lung, and a similar case is recorded by Sabourin and Oettinger. As a general rule, of course, they are benign.

[a] Orth, who writing in 1889, states Grawitz' views so strongly as to make them his own, admits of no doubt that the papillary growths are true adenomata.

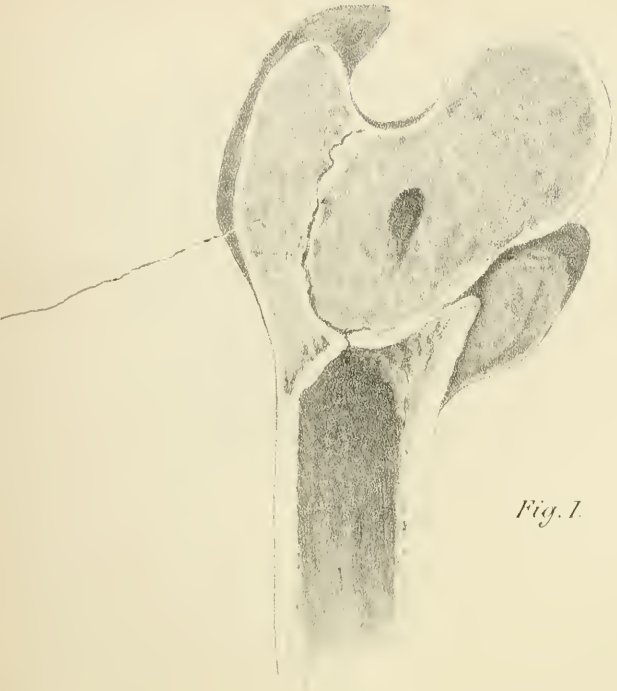


Fig. 1.

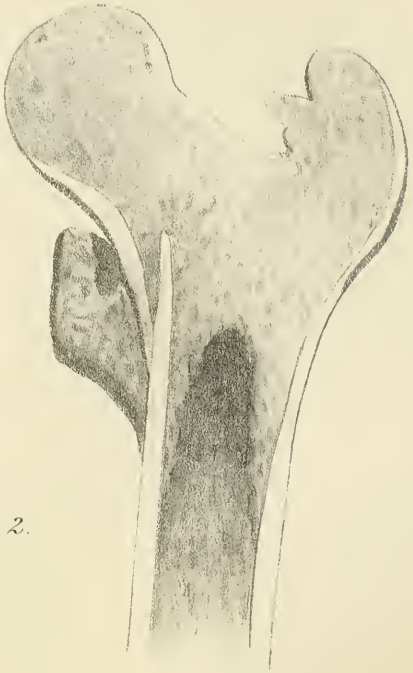


Fig. 2.

F.Huth, Lith^r Edin^r

Dr E.H.BENNETT ON EXTRA CAPSULAR FRACTURES OF THE NECK OF THE THIGH-BONE.

ART. X.—*Exceptions to the Type of Extra-Capsular Fracture of the Neck of the Thigh Bone.*[a] By E. H. BENNETT, M.D, F.R.C.S.; Surgeon to Sir P. Dun's Hospital; Professor of Surgery, University of Dublin.

MANY writers apply the term typical to this fracture because its site in the thigh bone, its pattern, and the injury which causes it are almost constantly the same. I read in one of our newest text-books:—"Extra-capsular fracture is produced by the application of great and direct violence to the trochanter major, as from a fall laterally upon the hip."[b] Mr. Erichsen writes:—"It is the result of the application of great and direct violence upon the hip."[c] I could quote many authors to the same effect.

Force of the kind described in these passages will produce the fracture in the dead body as well as in the living; and the fracture in this respect contrasts with the intra-capsular which is most difficult, some say impossible, to produce experimentally. This constancy of cause furnishes a valuable help in the diagnosis of the varieties of fracture of the neck of the thigh bone. There are, however, exceptions to it which, though rare, I think we must not disregard.

I prefer the statement of the case given by Hamilton to the rigid rule laid down in the passages I have quoted. He says:—"Fractures without the capsule seem to be the result generally of falls or of blows received directly upon the trochanter; occasionally, also, they are produced by falls upon the feet or upon the knees."

We must be prepared to go even further, and admit that the fracture, typical in all other details, may result from muscular action, without any fall or blow.

Sir Astley Cooper's first illustration (Plate I.) of extra-capsular fracture seems to be forgotten by many more modern writers—"Mary Clements, aged eighty-three and a half years, when walking across her room, October 1st, 1820, supported by her stick, which from debility consequent upon old age she was obliged to employ, accidentally placed her stick in a hole of the floor, by which, losing her balance, and tottering to recover herself from falling, which

[a] Read before the Section of Pathology of the Royal Academy of Medicine in Ireland, Friday, Feb. 17, 1893.

[b] Fractures and Dislocations. By T. P. Pick. P. 245.

[c] Science and Art of Surgery. Vol. I., 335.

she would have done but for those near her, she found she had, as she supposed, dislocated her thigh bone. . . . She ultimately sank, without any symptom of active disease, about fifteen months from the period at which the fracture took place."[a]

A vertical section of the specimen furnishes Cooper's first illustration of extra-capsular fracture of the ordinary variety with impaction of the neck into the trochanteric region of the bone with fractures of both trochanters which have united by bone. It is clear, then, that unless we ignore the very detailed account of the accident in this case, the typical fracture can result from muscular action without fall or blow on the great trochanter.

Some years ago a great gale blew over Dublin, and was at its height in the forenoon. In Fitzwilliam-square a man was blown by a sudden gust across the roadway, and against the railings of the square, and had his leg broken. At the same time an elderly woman was blown off the uppermost step at one of the doors in Merrion-square. She was whisked off the step and, alighting on her feet on the flag-way, she saved a fall by catching the area railings. She was unable to walk, and was carried to Sir P. Dun's Hospital, where I treated her. The evidence was clear that she had not fallen on her hip, but there was not a doubt on my mind that the fracture of her thigh bone was the extra-capsular of the neck. It united in the course of time, and the permanent enlargement of the trochanteric region, which characterises this form of fracture when united, confirmed the diagnosis made in the early days of the case. I cannot give pathological proof beyond this of the nature of the fracture, for the woman lived to walk out of the hospital. I cannot determine whether the fracture was of the ordinary type, similar to that I have quoted from Cooper, or whether it might more probably agree with the variety of which I now submit three specimens to the Academy.

In the typical extra-capsular fracture, the base of the neck of the thigh bone is driven into the cancellated tissue of the bone between the trochanters to a variable depth, and the compact tissue of its inferior wall is seen in a vertical section, buried in the cancelli of the bone, and crossing the line of the compact tissue of the shaft. The vertical section, as well as the appearance of the surface of the bone, shows that secondary fracture or fractures of the bone result from the impaction of the upper fragment into the

[a] On Dislocations and Fractures of the Joints. By Sir Astley Cooper, Bart. F.R.S., &c. New Edition by Brasby Cooper, F.R.S. Page 167.

Fig. 3.

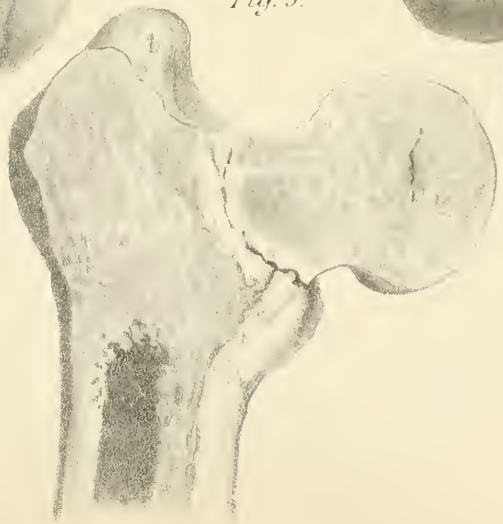


Fig. 5.

Fig. 4

Dr E.H. BENNETT ON EXTRA CAPSULAR FRACTURES OF THE NECK OF THE THIGH-BONE

lower. In specimens which present secondary fractures developed to the least degree, the great trochanter only is broken. Professor R. W. Smith, in the summary of his chapter on these injuries, writes:—"The extra-capsular fracture is accompanied by fracture with displacement of one or both trochanters," and in his discussion of this detail he writes: "Does it ever happen that the neck of the femur is broken external to the capsule without injury to the trochanter? My own experience leads me to believe that it does not."[a] In this passage the term trochanter means great trochanter.[b] This character may, therefore, be looked on as a feature of the typical fracture as essential as the ordinary cause of the injury. The specimens I now submit break the law of the type, as in all the great trochanter has not been broken. Vertical sections expose the further fact, that in these specimens the mode of impaction is the reverse of the ordinary; the lower fragment is, to some degree, impacted into the upper. This exception in the mode of impaction has not escaped the notice of Professor R. W. Smith. He writes: "There is a very remarkable variety of the impacted fracture external to the capsule, of which I have seen but one example. In this the lower fragment penetrates a short distance into the cancellated tissue of the superior, the reverse of what generally happens." An example of this singular form of impacted fracture has been delineated by Mr. King (Plate II.). Its occurrence must depend upon the direction in which the force which broke the bone was applied, but unfortunately I am not in possession of the history of the specimen represented in the preceding woodcuts.[c] I was able to identify these woodcuts as being taken from a half section contained in the museum of Steevens' Hospital, but there is no history preserved. I have seen such a specimen also in the museum of the Surgeons' Hall, Edinburgh, also without history. Mr. King's case[d] is without history bearing on the cause of the fracture. I have recently obtained from the dissecting-room a very perfect specimen of this variety of fracture (Plates III., IV., V.), and our museum contains two others. In these three the trochanter major has escaped fracture; in one the trochanter minor was fractured. In looking at this last and most perfect specimen, one cannot help being reminded of the kind of injury which I have described in the case of the woman who was blown off by the wind and lit on her

[a] A Treatise on Fractures in the vicinity of Joints. R. W. Smith. Page 111.
[b] Loc. cit., p. 16.
[c] Loc. cit., p. 35.
[d] Cyclopædia of Practical Surgery. Costello. Vol. II., p. 373.

feet. If we could fill the gap by obtaining a clinical history, combined with a pathological examination of this fracture, we might set up in it a second but very rare type of fracture of the neck of the thigh bone. Even supposing this to be obtained, however, we cannot put aside Sir Astley Cooper's case, and we must admit that the fracture of the ordinary type may occur from a cause other than great and direct violence applied to the hip.

PUERPERAL ECLAMPSIA.

Dr. Chas. Greene contributes to the July number of the *American Journal of Obstetrics and Gynæcology* an interesting report on the eclampsia cases occurring in the Boston Lying-in Hospital for the past eight years. Thirty-six cases in all came under observation, and are tabulated in the following manner:—Antepartum convulsions, 13; interpartum convulsions, 8; post-partum convulsions, 15. The cases grouped under these divisions had a respective mortality of 46 per cent., 25 per cent., and $6\frac{1}{2}$ per cent. We notice, as regards treatment, that it has been the practice of the Hospital to induce labour in all severe antepartum convulsions. In only three out of the thirteen was this not done, and of those three none of the mothers died, whereas in the remaining ten cases we find six maternal deaths—a mortality of 60 per cent. These facts are strongly confirmatory of the correctness of the views held in the Dublin School, namely—that to interfere with the normal onset of labour in eclampsia is bad practice. Parturition was terminated rapidly in all the patients in which the disease did not set in until labour had already commenced. This, we think, is a line of treatment that will commend itself to all practical men; but for its performance we would prefer the forceps to any other means, and these, in our opinion, should not be applied until the head is fixed in the brim, and the os at least three-fourths dilated. Manual dilatation of the cervix, followed by internal version, is the method which finds most favour in the Boston maternity; but as this plan is attended with much greater shock to the patient and irritation to the uterus—both leading factors in the unfavourable termination of the disease—we are sorry that Dr. Greene at least did not let us know the reasons why such a line of treatment should be preferred to any other. Amongst the drugs popular in the maternity we are surprised to see pilocarpin holding a foremost place. That it acts as a diaphoretic is without doubt, but that it also has a depressing influence on the heart, and induces a condition of œdema of the lungs, would, we had hoped, be considered by all an absolute contra-indication for its use when dealing with a disease the unfavourable end of which is so frequently ushered in by the advent of one or both of these complications.

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CARNRICK'S PEPTONOIDS, IRON AND WINE.

"IT would be a difficult matter to determine whether in modern therapeutics drugs ordinarily so called, or dietetic preparations, hold the more prominent place. In the treatment of chronic debilitating diseases of modern life, at least, the latter are of the very greatest use, and they are of equal, if not greater, value in the management of the trying period of convalescence from acute diseases. CARNRICK'S BEEF PEPTONOIDS have won high approval as an excellent dietetic preparation; they are made from meat, wheat-gluten, and milk, and contain (in a partly digested or easily digestible form) nitrogenous materials of vegetable and animal origin. The distinguishing character of the preparation is the large proportion of soluble albumen and peptone present in combination with the extractives and salts which are valued for their stimulating properties.

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PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Anæsthetics and their Administration. By FREDERIC W. HEWITT, M.A., M.D., Cantab, &c. London: Charles Griffin & Company. 1893. Pp. 357.

THE author commences his useful book by stating that his pages have been written in the hope that they may prove of service to those practitioners and students who wish to obtain information concerning the administration and effects of general anæsthetics. Dr. Hewitt adds:—"Until within the last few years systematic instruction in this branch of practice was almost unknown, and even at the present time the opportunities which a student has of making himself proficient in the use of anæsthetics are, with rare exceptions, lamentably inadequate. It thus happens," the author goes on to say, "that numerous recently qualified practitioners leave their hospitals possessing but the scantiest knowledge of the subject, and, owing to the bewildering mass of literature which exists, and to the difficulty of extracting any really practical information from it, they regard all further attempts at self-instruction as hopeless, and resort to the simplest rather than the safest plan of anæsthetising their patients."

We have carefully read over this concise manual of over 350 pages, and we consider its publication has supplied a felt and practical want; for we believe the great advance of operative surgery in the present day could only have been reached with the aid of anæsthetics, by whose beneficent effects the patient calmly and securely sinks into the mysterious sleep of insensibility, trusting himself entirely to the goodness of his Maker and to the skilful hands of the operator.

The book before us is divided into four parts. Part I. treats of preliminary considerations such as the properties and impurities of the chief agents used for producing general anæsthesia,

also regarding the general condition of the patient, such as sex, age, temperament, habits of life, condition of respiratory, circulatory, and nervous systems. Part II. refers mainly to the selection of the anæsthetic. Part III. refers to the management and treatment of the difficulties, accidents, and dangers of general anæsthesia. Part IV. refers to the condition of the patient after the administration of the anæsthetic.

The duties and responsibilities of the anæsthetist, we consider, are quite as important as those of the operator, and we have heard from others, and have felt ourselves, that the result of the anæsthetic causes greater anxiety than the performance of the operation itself. The hap-hazard way in which some residents, house surgeons, and general practitioners administer anæsthetics is simply appalling. The performance looks simple enough, and all will undertake the responsibility, little dreaming of the risk they run in administering a remedy of the properties and effects of which they are probably totally ignorant. The sad mishaps of which we read so constantly in the different medical journals could, or might be, traced to downright ignorance or carelessness on the part of the administrator. The time, we think, has come when no one should be permitted to administer any anæsthetic until he has received special training, and, in this most important branch of therapeutics, we think all medical men should pass an examination in the subject before being appointed anæsthetist to any institution, and should have by heart all the information so practically detailed in Dr. Hewitt's book.

If we ask which is the safest anæsthetic we meet with some conflict of opinion among the different authorities. We are nevertheless strongly of the opinion that ether is the safest anæsthetic known. Morgan and Ormsby of Dublin have indisputably proved by statistics, which cannot be gainsaid, that ether is eight times safer than chloroform, and in fact the safest anæsthetic in use. At page 63, Dr. Hewitt mentions that Mr. Jonathan Hutchinson, in a very forcible article on the safety of ether, says—"I speak from a tolerably extensive observation, both of my own facts and those of others, when I say again what I have often said before, that I think that we ought to have a clear canon in full force on this most important subject. I have not the slightest misgivings in my belief *that the restrictions of chloroform would save many lives every year.* The canon I

would venture to suggest is this, *never give chloroform alone in the first instance, let it be either preceded by ether, or in mixture with it.*" The italics are Mr. Hutchinson's.

Mr. Pridgin Teale, of Leeds, "stated that he felt very strongly that ether ought to be the anæsthetic taken up by hospitals and schools, and that they ought to be turned out from these institutions able to give ether, and then they would have at hand an agent which was perfectly safe." Mr. Bailey and Mr. Woodhouse-Braine, who have for a great many years devoted themselves exclusively to the administration of anæsthetics, and who have used both ether and chloroform in some thousands of cases, have no hesitation whatever in their preference for ether.

Dr. Hewitt himself is just as emphatic when he states, "My own experience with the two great anæsthetics, ether and chloroform, has led me to regard the former as the most suitable agent for general surgical work; and I venture to assert that unless strongly contra-indicated by the condition of the patient, or the nature of the operation, ether should invariably be employed. I would go even further than this, and urge that when any doubt exists as to the suitability of ether this anæsthetic should be tried, and only abandoned in the event of its being badly borne by the patient. Persons regarded as unsatisfactory subjects for ether may often be successfully etherised if the agent be administered in the proper manner."

Morgan and Ormsby, of Dublin, by their persistent warnings and writings in the journals, advocating the use of ether as a safe anæsthetic, have no doubt gone a long way to reintroduce it into surgical practice. Morgan wrote strongly on the subject, and Ormsby, for the credit of the Irish capital, followed up the matter with energy and determination, and the inhaler which he invented is undoubtedly the most simple and useful in the market. University College Hospital, London, was the institution in which Mr. Ormsby first demonstrated the use of his inhaler on cases of Mr. Christopher Heath's, in the presence of Mr. Mayer of the firm of Mayer & Metzler, who afterwards designed the small Clover's Inhaler, which possesses the Indiarubber bag of Ormsby's, but which is, in our opinion, more complicated and less portable than the original model mentioned, and which it so very strongly resembles.

All interested in the subject of anæsthetics should at once

procure Dr. Hewitt's book, being the bes treatise on the subject we have yet read. House surgeons and administrators of anæsthetics will find it a most useful and practical guide.

The Hygiene Diseases and Mortality of Occupations. By J. F. Arlidge, M.D., &c. London: Percival & Co. 1892.

We regret that time and space have so limited our work during the past few months that we have been unable to notice Dr. Arlidge's excellent book on the relation of diseases to occupations. The work is so complete and comprehensive that an attempt to criticise fairly or even praise, as deserved, the manner in which the author has dealt with the many and diverse subjects which he has discussed would end only in failure. We can most strongly recommend Dr. Arlidge's work as the best ever written on this very difficult subject, which, as the author truly says in his preface, "few British physicians had studied," and "no treatise had been written upon for a long series of years." One of the principal obstacles which a writer has to encounter in arranging a work of this sort is the difficulty of arriving at anything like an intelligible and at the same time comprehensive classification. Dr. Arlidge has overcome this difficulty as far as such is possible—for to get rid of all imperfections is impossible. Dr. Arlidge, after some introductory remarks, deals with the "Conditions and Circumstances of Labour" from almost every conceivable point of view; then, with the statistics connected with this branch of the subject, pointing out the many fallacies connected therewith. The author then proceeds with his detailed classification of occupations, and discusses the diseases incident to each. We must refer our readers to the work itself for information on this subject, which, as we have already observed, cannot be fairly dealt with in a notice such as this.

Sulla Origine dei Corpuscoli del Sangue. Ricerche del Dott. Vincenzo Allara. Milano: Chiesa & Guidani. 1893. Pp. 155.

S. Allara has previously published an essay on Magnetism in Animals and Plants, which first appeared in the Florentine journal *Lo Sperimentale* in February, 1881; and an inquiry into

the cause of Cretinism, which was printed in Milan last year. The present work is divided into six sections, the last summarising the conclusions at which the author has arrived upon the embryonic origin of the blood-corpuscles, white and red, in vertebrates. These conclusions are the result of much patient research. To all but students of minute physiology the third section will probably be the most interesting. Taking for a text Haeckel's dictum that "ontogeny is a summary recapitulation of phylogeny, phylogeny is the efficient cause of ontogeny," S. Allara devotes sixty-two pages to a sketch of the "development of organisms in the zoological series." He traces the correspondence between the successive stages of the vertebrate embryo and the ascending scale of animal organisms, starting from the monera, the product, he assumes, of spontaneous generation. He distinguishes five primordial evolutionary stages of animal life—the monerula, the amœba, the synamœba, the planæa, and the gastræa, from the last of which the existing animal kingdom has been developed, through two ramifications, the zoophytes and the worms. "Man," he says, "and every other species, in their earliest forms, traverse the stages through which the series of organisms has passed to gain the gradation to which its development can attain. Man in the womb has been successively a *monerula*, a *citula*, a *morula*, a *blastula*, a *metagastrula*; the citula corresponds to an amœba, the morula to a synamœba, the blastula to a planula, the gastrula to a gastrea. In succeeding stages the embryo corresponds to a cordonius, to an acraniote, like the amphioxus; to a cyclostomoid, to an ichthyoid, to an amniote with a cloaca, like the monotremata, and, finally, to a placental mammal."

Text-book of Ophthalmology. By Dr. ERNEST FUCHS. Translated from Second German Edition by A. DUANE, M.D., New York. London: H. & K. Lewis.

DR. DUANE is to be congratulated upon the excellent translation he has made of Professor Fuchs' text-book. It is no easy task to render into English a German work of nearly 800 octavo pages, and Dr. Duane has accomplished it so successfully that, in spite of occasional German idioms and American spelling, he has produced a readable book. Professor Fuchs' text-book is well worthy of a translation, as it is, without exception, the best work of the

kind which has appeared for many years in Germany. It is not an encyclopædia like the Graefe-Sæmisch Handbuch. It only gives the ophthalmological public a full and complete account of the doctrines which are taught by the eminent man who now occupies the chair of ophthalmology in Vienna. Criticism of a work of this kind is difficult, and it is rather a futile proceeding to write the mere panegyric which this book deserves. It may suffice to note some of the points in which Professor Fuchs' teaching differs from what is usually taught in the United Kingdom, and to call attention to his opinions upon some of the *quæstiones vexatæ* of ophthalmology.

The first of the vexed questions touched on is the cause of the light reflex on the retinal vessels. This is disposed of in a single sentence, and the theory adopted is that of Jæger, that the reflex is from the anterior wall of the blood column. It is curious that after all that has been written about this subject no mention should be made of the other theories advocated in America, England, and even Vienna itself, for the Viennese school is not at all united in its views on this point.

The clinical descriptions of the various diseases, the brief anatomical introductions to the various sections of the work, and the pathological anatomy, are all of the highest excellence, and it is only when we come into the region of theoretical speculation or practical therapeutics that we can find subject-matter for comment. It is interesting to observe, for instance, that Professor Fuchs finds in a two per cent. solution of nitrate of silver his sole and sufficient remedy for acute catarrhal conjunctivitis. When a surgeon has obtained a good remedy for any disease he should certainly stick to it, but if it were only to relieve the monotony of out-patient practice we should like to have another remedy to use occasionally. In the chronic forms of the disease he gives us a greater choice.

In the section upon trachomatous conjunctivitis we notice a gross error in translation. Professor Fuchs is made to say that in the papillary form "there is now no thickening of the conjunctiva, the subjacent meibomian glands being visible through the latter." What is to be found in the German edition is that the thickening of the conjunctiva no longer permits the subjacent meibomian glands to be perceived through it! We cannot believe that mistranslations like the above are at all frequent in Dr. Duane's

work; for, although in every case when the meaning seemed at all doubtful to us we have compared the translation with the second German edition, the above paragraph is the only one in which we lighted upon an error of any importance.

Professor Fuchs' opinion is that there is but one kind of trachoma, which, however, appears under various forms; and that the ultimate origin of the disease is probably to be found in the secretion of genitals affected with gonorrhœa. But the relations of the different forms of blennorrhœa, trachoma, and follicular conjunctivitis to each other will finally be determined by bacteriology—at present the only microbe satisfactorily determined is the gonococcus of acute blennorrhœa. Professor Fuchs, contrary to many—perhaps most—authorities, condemns all the operative or mechanical methods of treating trachoma, and relies upon caustics and astringents, and in cases of dense pannus jequirity.

In treating of keratoconus it is stated that the cause of the thinning of the central portion of the cornea is unknown, a statement which is hardly justifiable since the publication of Tweedy's paper on the physical factor in conical cornea, in the Transactions of the Ophthalmological Society, Vol. XII.

It has long been known that the fluid which forms in the anterior chamber immediately after paracentesis is much more albuminous than the normal aqueous, and this has been of late accounted for by a paralytic secretion from the ciliary gland. Fuchs attributes it simply to the transudation of fluid from the vitreous.

With regard to cocaïn, its effects are explained upon the assumption that it stimulates the fibres of the sympathetic. Hence, dilatation of the palpebral fissure is produced by contraction of Müller's muscles, an hypothesis which is somewhat superfluous, as the loss of the conjunctival reflex is quite a sufficient cause of the observed retraction of the lids. In this connection it may be noted that Professor Fuchs, unlike Professor Hirschberg, admits the existence of an atropin catarrh.

Cases of traumatic iridocyclitis are stated to be more particularly dangerous to the second eye when (1) the injury occurs in the ciliary region, and (2) a foreign body remains in the globe. This statement is now an ophthalmological commonplace, but its precise value and validity are alike disputable. Every case of traumatic iridocyclitis, no matter where the seat of injury may

be, and no matter whether there is a foreign body present or not, is fraught with peril for the second eye, and "particularly dangerous." It is the traumatic iridocyclitis that is particularly dangerous, not the situation of the wound or the presence of a foreign body. We observe that Professor Fuchs keeps an open mind upon the question of the method of transmission of sympathetic inflammation, waiting for further information in corroboration or the reverse of Deutschmann's views.

In the section upon pterygium we have the results of Professor Fuchs' original work upon this affection, which has been published in von Graefe's archives.

We observe that in Professor Fuchs' practice anterior synechia always results from Sæmisch's operation for hypopyon ulcer. This has not been our experience.

The increased depth of the anterior chamber which is so frequently observed in diffused interstitial keratitis is referred by Professor Fuchs to an increased secretion of aqueous. Is it not more probably due to the abnormal aqueous being unable to make its way freely through the spaces of Fontana, an hypothesis which would also account for the increase of tension in the disease, which Prof. Fuchs explains by the simultaneous existence of chorioiditis anterior? He states that increased tension is rare in diffused interstitial keratitis. In Ireland it is certainly not uncommon.

Glaucoma is treated of with admirable lucidity; but we notice an error in translation at page 349, fourth paragraph—the words "former" and "latter" should be transposed.

In the chapter on diseases of the lens it is stated that lamellar cataracts have been anatomically examined by Deutschmann, Beselin, Lawford, and Schirmer; but the reader would not be able to make out from Professor Fuchs' book that the principal outcome of these later observations is that the pathological changes are found all through the nucleus of the lens, and are not at all restricted to the layers in which the macroscopic opacity lies.

Professor Fuchs seems to have an open mind with regard to the theory of colour perception as well as other modern theories. Both theories—that of Young and Helmholtz and that of Hering—are given with impartial justice.

We suppose it is by a slip of the pen that the tarsus is stated to be made of fibro-cartilage, for all modern authorities deny that cartilage in any form enters into its composition.

In treating stricture of the nasal duct Professor Fuchs slits the lower and not the upper canaliculus, a proceeding which we consider unsound on theoretical grounds, and also condemned by the results of experience. Either canaliculus does equally well for the passage of the probe, but the patient will feel the loss of the lower one much more to his future discomfort than that of the upper.

Another point on which, indeed, Professor Fuchs will not get many ophthalmologists to agree with him is the postponement of operations for convergent strabismus until the patients are ten years old, because some cases get cured of themselves. These cases are far too rare to justify such a general rule.

We think, too, it is an error to attribute von Graefe's symptom in exophthalmic goître to a lesion of the sympathetic. If so, it must be an irritative lesion. All the other symptoms can be accounted for by paralytic lesions, and why not this one?

The translator has given the classical derivations of ophthalmological terms in footnotes. To one of these we would take exception, or, rather, to two—hemeralopia and nyctalopia. The former is said to be derived from *ἡμέρα*, day, and *ὤψ*, sight, but properly, the eye; the latter from *νύξ*, night, and *ὤψ*, sight. This may possibly be so, but such a derivation takes no account of the *l*—the *l* which is thus inserted needlessly in both words. The correct derivation is almost certainly from *ἀλαωπός*, blind, from *ἀλαός*, blind, and *ὤψ*, the eye. Professor Fuchs uses the term hemeralopia to signify night blindness, and nyctalopia, day blindness, therein following the common custom of European text-books. It is most probable that the earliest authorities used these terms in the exact contrary senses, and rightly, as we believe most readers of Mr. Tweedy's papers in the Ophthalmic Hospital Reports will admit.

To conclude with a few remarks on the chapter on operations. Professor Fuchs ordinary asepticism consists in disinfecting the operator's hands with four per cent. solution of carbolic acid, or corrosive sublimate 1 in 2,000, and the instruments with boiling distilled water, or with carbolic acid. The conjunctival sac is washed out with sublimate solution 1 in 4,000. Of course the more dangerous cases of lacrymal or conjunctival disease receive a more energetic treatment. After the intraocular operations both eyes are bandaged, and the patient kept supine in bed for several days. Several methods of cataract extraction are well and

clearly described, but in De Wecker's corneal flap extraction the all-important point of gauging the size of the incision by the height of the flap is omitted.

Professor Fuchs' general conclusion as to cataract extraction is that the corneal-flap extraction without iridectomy gives, under favourable circumstances, the most perfect result; but it is not adapted to all cases, nor does it give the same certainty of success as the scleral-flap extraction with iridectomy. One section of this last chapter we do not regard as quite up to date, viz.—that on trichiasis and entropium operations. Professor Fuchs mentions, but apparently does not practise, the transplantation of mucous flaps for the cure of these deformities; as soon as he does he will give up the old Arlt Jaesche transplantation which still seems to flourish in Vienna.

A Handbook of Obstetric and Gynæcological Nursing. By the late Fleetwood Churchill, M.D. Revised and greatly enlarged by Thomas More Madden, M.D., F.R.C.S. Ed.; Gynæcologist, Mater Misericordiæ Hospital, &c.; formerly Master, National Lying-in Hospital; Assistant Master, Rotunda Hospital; Vice-President, British Gynæcological Society, &c. Dublin: Fannin & Co. 1893. Small 8vo, pp. 207.

There is, to say the least of it, plenty of room for a good and practical manual in obstetric nursing, and it is, therefore, a move in the right direction when such an admitted authority as Dr. More Madden throws his energies into the perfecting of such a work.

Needless to say, under the circumstances, the book is clearly and concisely written, interesting all through, it affords much information of the greatest practical advantage to the class of readers for whom it is intended.

The work is published by Messrs. Fannin & Co., Dublin, in a very compact form. It consists of 259 obstetric and 49 gynæcological pages. The woodcuts on the whole are good, though some of them might easily be dispensed with, without in anyway detracting from the efficiency of the book.

We regret to find that no mention is made of abdominal palpation as a means of diagnosticating the position and presentation of the fœtus. This we look upon as a very grave omission, believing, as we do, that the method is easily learned, free from harmful

results, and is infinitely more accurate in its diagnostic results than that which is attained by any other means.

In the chapter on natural labour it is not laid down that the infant's mouth should be cleared of mucus and wiped before it has had time to breathe. Minute directions are given as to the most efficient methods for removing mucus from the bronchial tubes of the infant; but it undoubtedly is much preferable to prevent mucus getting into the air-passages than to subsequently employ means to rectify a condition which ought never to have occurred.

We cannot find that the nurse is recommended to wipe the infant's eyes, or use any other precautionary measure to guard the organs from an attack of infective ophthalmia. This latter disease does not apparently receive any mention throughout the book.

The directions as to proper disinfection of hands and instruments before they are permitted to come into contact with the patient, are very imperfectly given, and this, we think, is one of the most unfortunate mistakes of the work. Undoubtedly personal cleanliness is insisted upon in several places, but the minute details necessary to ensure true asepsis are for the most part left to the imagination.

The attendant's responsibility in the prevention of acute sepsis is not, we fear, sufficiently dwelt upon.

Dr. Madden believes this disease may arise from a variety of causes, many of them beyond the control of the accoucheur—a number of these are stated, such as scarlet fever and a vitiated atmosphere—so that the midwife who reads the book will be at no loss to account for a source of infection other than her own want of cleanliness.

The methods advised to be employed by the beginner in the passage of a catheter are good, but there is no warning to thoroughly disinfect the parts before the instrument is used. Gum-elastic and celluloid catheters are unfortunately recommended in preference to the more aseptic glass and metal instruments.

Dr. Madden holds that a rigor may result from "the coming of the milk," and adds, that it need occasion no alarm when arising from this cause. We hoped that the doctrine of "milk fever" had long since been discarded, and regret that a man of Dr. Madden's eminence should arise to lend the weight of his authority to such an exploded fable.

Let truth assert itself at any price, and let us once and for all face the fact that we have to do with some form of septic infection

when a rigor occurs anytime after twelve hours from the completion of labour.

In several parts of the work sponges are recommended, not only to cleanse the external genitals, but even to plug the vagina in cases of post-partum hæmorrhage; they are, however, rightly condemned on page 162, but too late in the book to make the correction of any great value.

We do not wish to proceed any further in the criticism of a work that does not aim at anything beyond a nurse's help. The manual is probably as free from defects as any other work of its kind, and it is in no unfriendly spirit we point out what we consider its deficiencies to be.

In conclusion, we would strongly recommend every midwife to become possessed of the book, for, containing as it does the ripe experience of such eminent specialists as Dr. More Madden and the late Dr. Churchill, it cannot fail to convey a fund of valuable information to those who study it.

RECENT WORKS ON LEPROSY.

1. *Report of the Leprosy Commission in India*, 1890-91. Calcutta. 1893. Pp. 456.
2. *Leprosy in New South Wales.* (*Report for* 1892 *on Administration of the Leprosy Act; and certain Information respecting the Prevalence of the Disease in the Australian Colonies.*) Ordered by the Legislative Assembly to be printed, 23rd March, 1893.

1. This Report has been so completely summarised and so thoroughly discussed by our weekly contemporaries, that we shall do no more than express our cordial concurrence with the Commissioners in the conclusions at which they have arrived, after exhaustive inquiry on the spot. It was not to be expected that the Committee at home would accept with equanimity conclusions as to contagiousness of leprosy and segregation of lepers, which, if accepted, could not fail to make the panic, out of which Committee and Commission grew, seem *tant soit peu* ridiculous. Accordingly, we find the Committee expressing their disagreement with the opinion "that the extent to which leprosy is propagated by contagion and inoculation is exceedingly small," and refuse to accept the Commissioners' strongly and repeatedly expressed opinion that segregation of lepers is unnecessary, and in India impracticable. On these

two points it is significant that the medical members of the Executive Committee agree with the Commissioners. We cannot but think that much of the popular panic about the spread of leprosy from lepers, and of the demand for segregation has sprung from a confused notion that *elephantiasis græcorum*, the leprosy with which we are now concerned, and the Levitical "leprosy" are identical. It is only necessary to read the Levitical description of the symptoms to see that there is absolutely nothing in common between the two diseases. In the Jewish case, moreover, segregation ceased to be imposed when the leprosy was complete. The patient who was leprous from head to foot was "clean," and could go where he would.[a]

It is impossible to speak too highly of the ability and industry displayed in this Report. The ingenuity with which the names of its authors have been concealed by the Executive Committee is most remarkable. The object was, no doubt, to compel those who are anxious to honour those to whom honour is due to read through the entire volume for their own good. We shall partially lift the veil by indicating page 390 as the place where the secret is buried.

2. We are indebted to the kindness of Dr. J. A. Thompson, Chief Medical Inspector under the Leprosy Act, for a copy of this Parliamentary paper, to which are appended his detailed notes of thirty-four cases. These include all patients of European descent, thirteen in number, admitted into the Lazaret since its establishment (1888), and twenty-one coloured lepers who survived into 1892. On the 31st December of that year thirty lepers were inmates of the institution, two natives of New South Wales, of British descent, and one Chinaman had died during the year. There is accommodation for 48 patients—40 males and 8 females. The Board of Health consider this sufficient for the colony. "It is hoped that notification and segregation of lepers will be the means of eradicating the disease from the colony; for in view of the steady decline of Chinese immigration, of the greater attention which is now being paid to the sanitary inspection of Chinese camps and quarters, and of the strict segregation of all known cases, the Board has reason to hope that New South Wales may yet be saved from having leprosy a disease permanently abiding in the colony; and the Board trusts that by the health authorities

[a] Gehazi, it will be remembered, after becoming "a leper as white as snow," appears in a prominent position in court.

of other colonies rigidly enforcing similar sanitary regulations, Australia may ultimately be freed from the disease."

So much for New South Wales. South Australia empowers (since 1884) its Central Board of Health to isolate lepers. In South Australia proper no cases are known; "but there are three or four cases (all Chinese) in the Northern Territory who are isolated on separate quarantine grounds." Western Australia "reports that there has been no case of leprosy since that of the Chinaman, Ah Lee, reported in 1890, and that this man is no longer in the colony." The Central Board of Health of Tasmania "reports that, so far as is known, the colony is entirely free from the disease, and therefore there has been no legislation on the subject."

In New Zealand no special Acts are in force. In 1890 a Report by Dr. Alfred Ginders was published as a Parliamentary paper, in which six cases among natives—all that had come under his notice—are detailed. The evidence collected by him goes to show that the disease was formerly more prevalent than it is now—in other words, that it is dying out, without segregation. One old native quaintly attributes the diminution of the disease—which, he said, he had known to carry off whole villages!—to the dying out of all the old men who knew how to communicate it. "My father," he deposed, "was one of the worst of them. He destroyed numbers by giving them *ngerengere*. His plan was to make his enemy a present of a mat or some other article of clothing that had been worn by a *ngerengere*, and the disease was sure to follow." We quote two of Dr. Ginders' conclusions from his study of the disease in New Zealand:—"7. That the immunity from the disease enjoyed by women who have lived for years with leprous men, and *vice versâ*, makes it difficult to believe that it is infectious or contagious in the ordinary sense. 8. That if the proliferation of a special microbe in the blood and tissues is essential to the disease, a very special environment would appear to be necessary to secure an effective invasion."

On Sledge and Horseback to Outcast Siberian Lepers. Illustrated from Photographs and Drawings. By Kate Marsden. London: The *Record Press*, Limited. 1892.

This interesting record of Miss Marsden's crusade "on behalf of helpless, hopeless, and homeless outcasts," is tastefully printed,

graphically illustrated, and eminently readable. The volume is dedicated to "Her Most Gracious and Imperial Majesty the Queen, the most queenly woman and the most womanly Queen." The text is divided into fourteen chapters; there is a rather lengthy appendix, a map of the route taken by the authoress in her arduous pilgrimage, and twenty-six illustrations. The book is prefaced by two letters which form initial features that will probably prove attractive to every reader: the first is from Her Majesty Queen Victoria of England, the second from Her Imperial Majesty the Empress of Russia. Miss Marsden displayed true diplomatic wisdom in providing herself at the start with a letter from the Empress of Russia, recommending her to the protection and guidance of the leading officials of the various provinces through which she was obliged to pass on her way to Yakutsk. When it is remembered that the distance of this city from St. Petersburg is no less than 5,000 miles, and that the postal arrangements are so very unsatisfactory that the transmission of a letter and reply between the two places occupies many months, some faint idea may be grasped of the energy and pluck which must be attributed to the author of this volume for conceiving and carrying out the journey which it records. Without the special patronage which the Russian Empress granted at the outset, and the tact and coolness of judgment displayed by Miss Marsden throughout the whole period of her journey, there can be no doubt that the carrying out of her self-imposed mission would have proved quite impracticable. No less than 2,000 miles of this remarkable journey were traversed on horseback, and in the midst of physical dangers of a nature that constantly required the exercise of the coolest courage and the best diplomatic judgment, as well as enduring energy and an enthusiastic determination to persevere in the fulfilment of her allotted task.

Miss Marsden was further fortified in the course of her duties: mentally, by her deep religious conviction; physically, by her practice as a staunch total abstainer. Indeed, she goes so far as to attribute the preservation of her life during her prolonged pilgrimage in cold and fatigue to her teetotalism and her Jaegar clothing.

The terrible realism of the descriptions given by the writer of this volume, of the sufferings and surroundings of the unhappy lepers whom she had gone so far to visit, and whose condition she has already done so much to alleviate, is perfectly heartrending in

its vividness. "The poor lepers are so looked down upon as the very dross of the community, that even those wishing to befriend them have fallen into the way of thinking that the worst is good enough for them." "When once a man is known to be tainted with leprosy he is thrust out from his people, and driven away, as if he were some noxious animal, into a lonely spot in the forest, or on the marshes, where he is doomed to a living death. . . . . The only shelter he can find is some filthy little *yourta* (hut), which may have been tainted by another leper, who now, perhaps, is buried near the threshold. His first duty is to make a cross, which he is bound to place outside, as a warning to any one who may happen to pass to shun him."

We feel confident that Miss Marsden's graphic narrative will arouse the sympathies of all philanthropic readers. Her high-minded efforts in the direction of the alleviation of the miseries of the lepers of this winter Siberian region deserve all praise, and has already borne good fruit which will assuredly continue to increase.

If we felt inclined, as we do not, to criticise anything in this narrative of a very meritorious work, it would be that the author sometimes displays certain weaknesses in the direction of prejudice or fancy. For instance, on page 92, she informs her readers that at the close of her interview with the bishop of Yakutsk: "As I was leaving he came forward and blessed me. Perhaps some friends may think it wrong of me (a Protestant) to receive the blessings of a dignitary of the Greek Church." We confess that we think the adoption of this apologetic tone quite unnecessary. On page 90, in her description of the climate of the same city, we are told that: "The shawl which screens the face is soon covered with a *sheet* of ice, on account of respiration; the frost also covers the eyelashes, so that it is impossible to see at all. . . . . It is not light till ten or half-past, and is dark about two; and this state of things continues for nearly *eight months* out of the year." [The italics are ours.] We consider that both these statements require to be "discounted." But these are small faults in a record of genuine philanthropy and devoted self-denial.

Nuevo Concepto de la Histologia de los Centros Nerviosos. Por el Dr. D. Santiago Ramón y Cajal. Barcelona. 1893. Pp. 68.

Dr. Cajal has republished in pamphlet form three lectures delivered last year before the Academy of Medical Sciences of

Catalonia, which appeared in the *Revista de Ciencias Médicas de Barcelona.* His "new view of the histology of the nervous centres" is not capable of condensation into a brief notice, but it will, we believe, be found interesting to those physiologists who make a special study of the nervous system. The diagrammatic illustrations are clear and good. The cerebellum, cerebral cortex, the parts associated with the special senses of smell and sight, the ganglia, and the neuroglia are separately considered. A copious bibliography is appended, giving references to German and Italian books and papers.

Ancient Egyptian Medicine: a Bibliographical Demonstration in the Library of the Faculty of Physicians and Surgeons of Glasgow, 12th January, 1893. By JAMES FINLAYSON, M.D., Honorary Librarian to the Faculty of Physicians and Surgeons of Glasgow; Physician to the Glasgow Western Infirmary, and to the Royal Hospital for Sick Children, Glasgow. Glasgow: 1893. Pp. 55.

Herophilus and Erasistratus, &c., &c. By the same. Pp. 42.

WE are indebted to the author for copies of these two reprints—the former of which appeared in the *British Medical Journal*, the latter in the *Glasgow Medical Journal.* Egypt was the cradle of physical and mathematical, as India, of mental science; and it is impossible to read without interest the observations and the guesses at truth of men who were mummies some 35 centuries ago. The Eberspapyrus—found between the legs of a mummy in 1858—is "a kind of medical compendium or compilation which was written down, at the latest, in the year 1550 B.C., but which belongs in its separate parts to different periods of time more or less remote." It is to this document that Dr. Finlayson's lecture is chiefly devoted, and his account of it and translated extracts from Dr. Joachim's translation, are most interesting. We may mention, as a remarkable instance of the persistence of endemic disease, that an elaborate account is given in the papyrus of an affection which Dr. Joachim satisfactorily identifies with *Chlorosis Ægyptiaca,* the result of the presence of *ankylostomum duodenale* in the intestine. One-fourth of the population of modern Egypt are supposed to suffer from the same disease.

Herophilus is little more than a name to us, associated with his

torcular; and Dr. Finlayson tells us nearly all that is known about him. He is accused by Celsus and by Tertullian of vivisection *in excelsis*—of having dissected living men; and the churchman's attack upon him might have been read by a "returned empty" bishop at a Church Congress. "Herophilus, that physician, or butcher, who dissected six hundred persons in order that he might scrutinise nature; who hated man that he might gain knowledge: I know not whether he explored, clearly, all the internal parts of man," and soforth. Live material for practical anatomy seems to have been more abundant in those days than dead in the Burke-and-Hare period! A great anatomist Herophilus unquestionably was; while Erasistratus, with whom he is almost invariably bracketed, was a practical physician of renown. His diagnosis of Antiochus' disease—a passion for his young stepmother Stratonice—and his prescription of matrimony cheerfully administered by the father, the lady's husband, and followed by complete recovery, are well known. Perhaps equally interesting, and not so well known, is the fact recorded by Pliny, that the grateful father expressed his sense of relief by a fee of £25,000. Galen's animus against Erasistratus, shown by frequent "digs" at him in his writings, shows that at the end of the second century of our era his authority in medicine was potent. Galen, indeed, wrote a whole book to demolish Erasistratus' views of venesection. The latter, to Galen's disgust, preferred ligatures on the limbs to phlebotomy. Erasistratus invented the catheter, and, though he objected to excessive bleeding, to energetic purgation and to narcotism with opium, he could be heroic in other ways. He was wont to treat hepatic disease by direct applications to the liver. We thank Dr. Finlayson for these peeps into old-world medicine.

What to do in Cases of Poisoning. By W. MURRELL, M.D., F.R.C.P.; Physician to, and Lecturer on Pharmacology at, the Westminster Hospital; late Examiner in Materia Medica in the University of Edinburgh, and to the Royal College of Physicians of London. Seventh Edition. London: H. K. Lewis. 1893. Pp. 276.

A NEW edition of this work having been called for, the author has taken the opportunity of making it even more complete, and of revising the whole. Old methods of treatment have been improved, and new ones introduced. The effects of several new

poisons have been described, with the appropriate remedies. A new feature in this edition is the grouping of cases of Chronic Poisoning into a special section. In this the effects of lead, opium, alcohol, and other less important drugs are described.

We regret that we must comment adversely on one feature in this little book. On the 274th page we find the following paragraph :—"The following is a list of tabloids for hypodermic use manufactured by Messrs. Burroughs, Wellcome & Co. They may be conveniently ordered by their numbers. Those marked with an asterisk are specially useful in the treatment of cases of poisoning." Then follows a complete list of the tabloids, many of which cannot be of any use whatever in cases of poisoning. Similar tabloids equally good are made by several other makers. The whole thing looks far too like an advertisement, and, in our opinion, should not have appeared in a presumably independent work.

With this exception, we have nothing but praise for this book. It is the most practical and most handy work in existence on the subject, and it ought to be on the table of every medical man who is liable (and who is not?) to be called at a moment's notice to a case of poisoning.

POPULATION OF FRANCE.

THE *Gazette Médicale de Paris* (10th June, 1893), tabulates the numbers of births and deaths in France for the eleven years 1881–91. In 1890 deaths exceeded births by 38,446; in 1891, by 10,505. The heavy mortality of these years is attributed partly to influenza. The number of births is steadily decreasing—that for 1891 (866,377) being, absolutely and relatively, the lowest of the century, with the exception of that for 1890 (838,059). The birth-rate for the whole of France is 22·6 for 1,000 inhabitants, ranging from 13·8 in one Department to 32·8 in another. It is only half the rate prevailing in Russia.

DISEASE IN GUADALAJARA.

THE *Boletin del Consejo Superior de Salubridad* of Guadalajara, for April 14th, gives the causes of deaths in that city for March. Some of the figures are remarkable. Pneumonia is set down for 88 deaths, enteritis for 46, diarrhœa 45, variola 38; these were the most fatal diseases. Four deaths are attributed to scorpion-sting, 9 to tuberculosis, 9 to typhoid, 8 to typhus. The total was 378, in a population which seems to have been 7,000 in 1871.

PART III.

SPECIAL REPORTS.

REPORT ON PRACTICE OF MEDICINE.

By Henry T. Bewley, M.D., Univ. Dubl.; F.R.C.P.I.; Assistant Physician to the Adelaide Hospital; and Lecturer on Medical Jurisprudence in Trinity College, Dublin.

I. ON MYOCARDITIS.
II. LARGE DOSES OF BROMIDES IN EPILEPSY.
III. LIME-METABOLISM IN RICKETS.
IV. ON PULMONARY REGURGITATION.
V. THE TREATMENT OF TONSILLITIS BY MEANS OF INJECTIONS INTO THE GLAND.
VI. THE CAUSE OF EHRLICH'S DIAZO REACTION.
VII. CHROMIC ACID AS A TEST FOR ALBUMEN.

I. ON PRIMARY CHRONIC MYOCARDITIS.

Kelle gives a full account of some of those curious cases of heart-trouble in which the valves are normal, yet the organ is seriously impaired; cases in which the symptoms seem all to be connected with the heart muscle, and in which this affection of the muscle does not seem to be secondary to, or produced by, disease of any other part of the heart. The disease, therefore, must be looked upon as primary chronic myocarditis.

Every age is liable to this affection; but it is more common before the fortieth year. The factors which excite this disease are similar to those which cause endocarditis, except that rheumatic fever has not been so frequently present. The heart is usually found enlarged, both right and left sides being affected; the amount of enlargement varies greatly in different cases. The impulse can be seen and felt over an abnormally large area; the action is usually, but not always, irregular. It is remarkable how the action of the heart is influenced by mental conditions (excitement, &c.). The impulse is often too violent; the second sounds at the base are accentuated. The heart sounds are pure, or at most a little prolonged, unless the so-called "relative incompetence" of the valves causes murmurs.

Krehl's remarks on this subject are quoted. He showed that relative incompetence at the auriculo-ventricular openings can occur without any dilatation of the cavities; normally the muscle-bands in the neighbourhood of the opening, contracting with each systole, diminish the size of the opening, and enable the flaps of the valve to close it. When these bands are diseased, and are unable normally to diminish the opening, regurgitation occurs.

The peripheral arteries must be free from atheromatous disease; otherwise it is not possible to decide that the myocarditis has not been secondary to this change.

Feelings of discomfort about the heart are marked, especially in the later stages of the disease; attacks of true angina occasionally occur. In one case changes in the blood were found, resembling those occurring in pernicious anæmia. The temperature is usually normal; occasionally there is hectic fever.

After death both ventricles are always dilated and sometimes hypertrophied. The microscopic examination of the muscle-fibres shows extensive, finely granular, fatty degeneration, swelling, cloudiness, and in spots even necrosis. Numbers of round cells are seen between healthy muscle-fibres; vascular newly-formed connective tissue is seen, which in places surrounds remains of muscle-fibres and nuclei. Masses of dense fibrous tissue, containing very few cells, were also found. The arteries of the myocardium are not extensively diseased; spots of atheroma are seen in some.

As regards ætiology, most of the cases can be traced to some disease of an infective nature—typhoid, rheumatism, scarlatina, diphtheria, erysipelas, or syphilis; for those cases which appear to have come on without any cause we may assume the existence of some slight infective attack which left no traces behind it, such as tonsillitis.

With regard to diagnosis, it is of considerable importance if we find abnormal activity of the heart, which cannot be referred to peri- or endo-carditis. If the rhythm is irregular while the sounds are pure, the diagnosis is certain. As regards the differential diagnosis from atheroma of the coronary arteries, the age of the patient, and the condition of the peripheral arteries must be considered. If murmurs are present, and yet the pulmonary second sound is not accentuated, myocarditis probably accounts for the weakness of the right ventricle.

It is difficult to say what course these cases will run; some in the Leipzig Hospital soon ended fatally; others quickly improved,

but were not cured at the time of their leaving hospital.—*Centralblatt f. innere Med.*, 1893, No. 19.

In a paper on this subject, Fräntzel states that there are four forms of this disease: it may be (1) diffuse, or (2) circumscribed, and either of these may be acute or chronic.

Acute Circumscribed Myocarditis shows itself as an abscess in the wall of the heart. During life there is nothing characteristic; the disease runs a rapid course, and ends fatally. The diagnosis can never be more than a matter of probability.

Acute Diffuse Myocarditis is rare; it may be a manifestation of pyæmia and similar conditions, and appear as numerous abscesses; or it may be primary (rheumatic), and only cause a change in the colour and consistence of the heart. The latter is the more usual form, but is generally overlooked, because it is not necessarily rapidly fatal, and connection between the conditions observed during life and after death becomes obscure. The positive signs of the affection—viz., increasing weakness of the heart, slight dilatation, and progressive disturbance of the circulation—can only be proved to be due to an inflammatory condition of the heart-muscle when it is possible to exclude all other lesions which might cause the symptoms observed.

The *chronic circumscribed* form, excluding syphilitic cicatrices, is observed as a thinning of one particular spot in the heart's wall, or ventricular septum—often the seat of aneurysmal dilatation.

In *chronic diffuse myocarditis* we have an extensive infiltration of the tissue with round cells and young connective tissue; these changes are sometimes most marked under the pericardium, sometimes under the endocardium, sometimes in the papillary muscles. The left side of the heart is more often affected than the right.

The clinical symptoms of chronic diffuse myocarditis are those of uncompensated heart-failure—passive hyperæmia, œdema, hæmorrhages into various organs. In consequence of the disease of the myocardium, the tension in the arteries is lessened, the veins remain full. Sometimes the earliest symptoms are referable to the pulmonic circulation: shortness of breath on exertion, palpitation, and pain in the cardiac region. The progress of the case is downward; the usual thoracic and abdominal symptoms of heart-failure occur. Palpation and percussion of the heart [illegible]unds do not show any marked deviation from the normal: the [illegible]or at are pure but irregular in force and rhythm. The pulse is [illegible]ence" and easily compressible.—*Centralblatt f. klin. Med.*, 1893, [illegible]

II. THE EFFECT OF LARGE DOSES OF BROMIDES IN THE TREATMENT OF EPILEPSY.

Féré gives an account of 20 cases of severe epilepsy which were treated with large doses of potassium and strontium bromide. The cases had not been benefited by the administration of moderate doses of bromides. Féré has shown that very large doses are not only harmless, but are also of much use in relieving the disease. He states that he has under his care twenty patients who take daily from 260 to 320 grains of bromide of potassium or strontium. Most of the cases had been under observation for years; the average frequency of the attacks was ascertained before the treatment was begun; then moderate doses were first given, and gradually increased, till, two or three years afterwards, the patient was taking 260 to 300 grains daily.

In nearly all the cases the number of attacks diminished considerably; two cases, however, were not benefited.

If bromism occurs Féré recommends that the drug should be stopped and purgatives given, and pilocarpin injected subcutaneously to promote its elimination.

Féré believes that mild cases can best be treated with moderate doses of bromides, but considers that in severe and obstinate cases we should not hesitate to give large doses.—*Rev. de Méd.*, March, 1893, and *Med. Chronicle*, May, 1893.

III. LIME-METABOLISM IN RICKETS.

Vierordt (Heidelberg) gives an account of investigations on this subject which he has made in both healthy and rickety children. He examined the amount of lime in the urine while the children were kept on the same diet, also while they were being given large amounts of inorganic lime salts. The children all lived in the same manner; they were fed on broth and milk. It was noticed that there was a kind of constancy in the amount of lime excreted, about 0·003 gram per kilogram of body-weight. In this respect there was no difference between healthy and rickety children. Inorganic salts of lime to the amount of 0·2 gram per kilogram were given; the amount of lime excreted was rather more than sound, but in this case again there was no difference found between the rickety and the healthy children.

It is true, therefore, if the same amount of lime be given, that rickety children excrete the same amount as healthy children. We may

conclude that the absorption of lime is not impaired in rickets; and insufficient absorption of lime cannot be the cause of the disease, or of the changes in the bones.—*Centralblatt f. Inn. Med.*, 1893, No. 25.

IV. ON PULMONARY REGURGITATION.

In a very complete paper on this subject Gerhardt states that this lesion occurs in the proportion of 1·5 per cent. of all cases of valvular heart disease. He collected from the literature of the subject records of twenty-nine cases. In three-fourths of these the lesion was the result of endocarditis, which in seven cases was the result of rheumatic fever; one case was caused by gonorrhœal infection; in one case an injury seemed to be the starting-point of the trouble; in one case the disease originated after childbirth. In one case the pulmonary disease was certainly primary, and in another case probably so. Congenital malformation and the persistence of fœtal conditions predisposel to disease of these valves.

In fifteen cases only the pulmonary valves were affected; the other valve diseased was most often the aortic, rarely the mitral. The patients' ages varied from eleven to eighty-four years.

The signs of the affection are as follows:—The impulse is too powerful, and is perceived over too large an area, being especially marked to the right of the usual position of the impulse. The heart dulness is increased, this increase being caused by hypertrophy and dilatation of the right chambers of the heart. A diastolic murmur is heard, loudest over the origin of the pulmonary artery, and conducted downwads to the apex, and is not conducted along the great arteries into the neck. The second sound is sometimes present, sometimes lost; frequently a systolic murmur co-existed, showing stenosis as well as regurgitation. In addition to these physical signs, Gerhardt noticed two others to which attention does not seem to have been called. In five cases he noticed that over every part of the lungs, especially over those parts most remote from the heart, he heard two dull sounds, something like murmurs. This he calls double sound in the branches of the pulmonary artery (Doppelton der Lungenarterienäste). A second sign, which may be called audible capillary pulse in the pulmonary circulation, is thus described: in parts of the chest at some distance from the heart (*e.g.*, at the

outer border of the right shoulder blade), when the patient draws a long, deep breath, the vesicular respiratory murmur grows louder with each systole of the heart, and then becomes more feeble.—*Charité Annalen*, xvii., p. 255.

V. THE TREATMENT OF TONSILLITIS BY MEANS OF INJECTIONS INTO THE SUBSTANCE OF THE GLAND.

Prof. v. Ziemssen read a paper on this subject at the Congress on Medicine held at Wiesbaden, April, 1893. Injections of a solution of carbolic acid were first recommended by Traube and Heubner in scarlatina; v. Ziemssen has found them useful in the various forms of tonsillitis, catarrhal, lacunar (follicular) and phlegmonous. He was induced to try this treatment by the consideration that most cases of tonsillitis are caused by some infective virus. All recent investigations into the pathological anatomy of the tonsils have shown that in the follicles there are found colonies of micro-organisms of all kinds—indeed they are found in the follicles of healthy tonsils; but it appears that as long as the epithelium is healthy they do no harm; when, however, the epithelium is in any way injured they make their way into the substance of the tonsil and excite inflammation there. In the sore throat of scarlatina in severe cases there are nearly always small abscesses in the centres of the tonsils, from which foci inflammation spreads to the cervical lymph glands, and may cause general septicæmia.

Von Ziemssen's treatment in cases of catarrhal tonsillitis consists in the injection of seven minims of a two per cent. solution of carbolic acid into the middle of each tonsil. He uses for this purpose a specially constructed syringe. Soon after the injection pain and difficulty in swallowing diminish, and the temperature becomes normal. Usually only one injection into each tonsil is necessary; sometimes a second is required in order to check the inflammation. It might be said that the fall in temperature was due to the natural termination of the attack; from the constancy, however, with which this fall followed the injections, and the immediate improvement of the symptoms, von Ziemssen believes the injections check the activity of the active microbes which are causing the inflammation.

The injections are easy to carry out, and do not irritate the throat.

Sahli (Berne), in the discussion which followed, stated his

agreement with v. Ziemssen as to the beneficial effect of this treatment both in tonsillitis and in scarlatinal sore throat. He said that latterly, instead of carbolic acid, he had been using iodine trichloride—a strong antiseptic, yet not a very poisonous body. He uses a two per cent. solution of this body in water, and injects one or two minims of this into the tissues in different places once or twice daily. He uses this method also in diphtheria, with surprisingly good results. He strongly recommends this treatment for general adoption, and adds that he uses an ordinary hypodermic syringe, and that the procedure is extremely simple and easy to carry out.—*Centralblatt f. innere Med.*, No. 25, 1893.

VI. THE CAUSE OF EHRLICH'S "DIAZO-REACTION."

Drs. Munson and Oertel (Newhaven, Conn.), while engaged in experimental work on the various abnormal constituents of diabetic urine, noticed that a urine which was known to contain large quantities of aceto-acetic acid ($CH_3-CO-CH_2-COOH$), and which gave a Bordeaux red, with a solution of ferric chloride, also gave a most marked diazo-reaction, these two reactions always running parallel in their intensity. They investigated various bodies found in diabetic urine, but the only one which gave both of these colour tests was aceto-acetic acid. They next prepared a solution of barium aceto-acetate, and compared it with urines from six cases of different diseases, all of which had this in common, that they gave positive results with the diazo-reaction.

The tests used were:—(1) Ferric chloride; (2) reactions disappearing on boiling or strongly acidifying; (3) iodoform test; (4) acetone in distillate; (5) extract with ether; (6) ethereal extract and ferric chloride test. In every case the reactions were identical. They therefore feel justified in announcing that aceto-acetic acid is the ætiological factor in the production of the diazo reaction in pathological urines; the acid probably occurs in combination with ammonia.

With regard to the value of the reaction as a means of diagnosis, they do not attach much importance to it; it is probably of no greater importance than the excess of phosphates or the trace of albumen with which it is so frequently observed.—*N. Y. Med. Jour.*, Feb. 4, 1893.

VII. CHROMIC ACID AS A TEST FOR ALBUMEN AND BILE.

Prof. Rosenbach recommends a 5 per cent. solution of chromic acid as a test for albumen in urine. When a few drops of this solution are added to albuminous urine, yellow flocculi are at once precipitated. It also is useful in detecting bile pigments. When the solution of the acid is added drop by drop to the urine, if bile pigments are present it becomes intensely green, and this colour lasts for some time. The test may be modified by saturating white filter-paper with the acid, and adding the urine to it, when if bile pigments are present, the green colour will at once develop. *Deutsch. med. Wochenschrift.*

THE "MARITIME MEDICAL NEWS."

This monthly periodical is published in Halifax, and is now in its third year. Its contents are of the average quantity and quality. We observe that the Ontario College of Physicians and Surgeons requires a five years' course of study, not being itself a teaching body. Dr. R. N. M'Charles reports an extraordinary case of an elderly farmer who entertained a frog in his stomach for 18 months. He swallowed, it would seem, some spawn in water, and unpleasant symptoms set in the same night. He consulted three doctors, two of whom candidly confessed ignorance, the third diagnosticating hepatic cancer, all agreeing that the patient had not long to live. He improved, however, though his health remained feeble and his spirits depressed; and 14 months after the accident he consulted the author for an attack of acute bronchitis, complaining then of gastric disturbance also. Recovering from the bronchial ailment he returned home and consulted two more doctors for his gastric complaint. They told him he had heart disease. "On his return in last March I was called in to see him, I found him suffering from both cardiac and gastric ailments. I directed my treatment to the heart, expecting to treat him for the other ailment later on. But as he felt he was improving he did not send for me again. About the first of this month the stomach trouble returned, or rather became worse, for he was never free from it. On the eighth he felt unusually miserable. The choking sensations were very troublesome. He felt as if he were going to die. During one of those choking spasms he made a strong effort to clear his throat of the 'lump.' Judge his pleasure and surprise on succeeding in throwing up a lively frog. Its body was about one and a half inches long. Its colour at first was pale and gelatinous looking, but now it is much darker, is gradually assuming a more natural colour since it has been exposed to the light.'

PART IV.

MEDICAL MISCELLANY.

Reports, Transactions, and Scientific Intelligence.

Waterborne Cholera.[a] By Ernest Hart, M.D., Editor of the British Medical Journal; Chairman of the National Health Society.

(*Continued from page 240.*)

D.—ITALIAN EXPERIENCES.

It is to Marseilles and Toulon that Italy is indebted for the severe epidemic of cholera which swept over the country in the autumn of 1884. When cholera broke out in the neighbourhood of Marseilles and Toulon, numbers of Italian workmen who were then employed in that neighbourhood fled across the frontier into their native country. Strenuous efforts were made to enforce land quarantine against them on the frontier, and thousands of travellers were, in consequence, detained in lazarettos at Ventimiglia, San Dalmazzo, Bardonnechio, Saluzzo, Pinerolo, and other places; but in spite of bayonets and batons, this theoretically perfect but practically discredited method of withstanding the march of infection once more utterly failed; and a great many frightened and unwholesome fugitives, bearing with them, in their persons or in their filthy clothing or chattels, the germs of the disease, succeeded in evading the cruel police cordons. By July 22 it was alleged that cholera had broken out at Spezzia, having, it is said, been introduced by arrivals from Toulon. Many of the inhabitants of Spezzia at once fled terror-stricken from the town. Gradually the disease spread through the provinces of Turin, Massa, Parma, Bergamo, Cuneo, on to Campobasso and Cosenza in the south of the kingdom. Before the end of the year some 27,000 attacks of cholera and upwards of 14,000 deaths had occurred, at least forty-four out of the sixty-six Italian provinces having been visited.

It was in the city and province of Naples that the severest outbreak of the disease occurred. There is a general agreement that the infection

[a] An Address delivered before the Forty-fourth Annual Meeting of the American Medical Association, held at Milwaukee, Wis., June 7, 1893.

was introduced from Marseilles by Italian workmen and sailors, although there may be some doubt as to which of the several channels was actually the earliest in operation. According to the United States Consul, some fifteen Italian sailors sailed from Marseilles, and arrived in Naples about the end of July. At the time of landing their presence was unknown to the municipal authorities. They passed one night in the Strada di Porto, but, being discovered, they were sent back to their ship, and left, presumably for Palermo. Their stay, however, was thought by some to have been long enough for them to have sown the seeds of the disease in Naples; but, according to the British Consul, the cholera was most probably introduced by sixty-five Sicilian workmen who, having crossed the frontier from Marseilles, were detained in quarantine for some prescribed period on a floating hospital at Spezzia, and thence were shipped to Naples, where they arrived on August 3, and took up their quarters in the Porto district, one of the most squalid and insanitary quarters of the city. On August 6 and August 18 other similar detachments arrived. One man who arrived on the latter date put up in the Marcato district, another of the worst parts of the town, and, sickening with cholera the same night, died within forty-eight hours. Other cases followed producing in the circumstances well-founded anxiety; but it was not until September 1st that the disease broke out with sudden and considerable violence. On that day there were 60 cases and 20 deaths notified; on the next day there were 127 fresh cases and 65 deaths; and so on until on September 11th 949 fresh cases and 357 deaths were announced. This was followed by 848 fresh cases and 386 deaths on the 12th, and 693 fresh cases and 231 deaths on the 13th, after which there was a gradual decrease in the daily numbers until the epidemic practically ceased early in November. Between August 23 and November 9 some 12,345 cases and 7,086 deaths had occurred among a population of 492,908.

Anyone who has visited Naples must, while charmed with the unequalled natural loveliness of its magnificent site, have been struck by the squalor and unwholesomeness of the place. After visiting the town just before the epidemic of 1884, I was driven to describe it as the dirtiest, raggedist, most obscene and squalid city of Europe. There was hardly anywhere to be seen a population more poverty-stricken, more miserably housed, more filthy in their habits. The atmosphere of a great part of the town was an infection, the defilement of the streets was unspeakable; the mortality of the city was excessive, although it is surprising, almost incredible, that it was not greater. When, therefore, cholera reached Naples, in 1884, it found a most congenial resting-place, and in the peculiar water supply arrangements in vogue there was the most complete provision for its indefinite extension. That peculiar system, and its relation to the nastiness of the domestic arrangements, are clearly

described by Dr. Shakespeare in his interesting work on cholera. He points out that the houses of the poor quarters are many stories in height, and are tenanted by families who live in flats. The upper flats are constructed upon the same plan as the lower ones, the kitchens of all being directly over each other. The water-closets, when they exist, usually occupy one corner of the kitchen, and connect by untrapped pipes with the main perpendicular drain, which leads to a *pozzo nero*, or sort of filth receptacle in the basement of the house. It is usually only the overflow of the fluid contents of the *pozzo nero* which enters the main house drain and passes to the street sewer. The walls of the *pozzi* are usually very imperfectly, or not at all cemented, the floor of the sink being formed by the porous earth. The solid accumulations in the *pozzi neri* are often not removed more than once a year. In most of the large houses there was, at least until 1885, a very peculiar individual provision for water. Running water flows in masonry trenches from house to house, ordinarily a little underground. In the course of the trench, as it passes beneath the house, there is a cistern sunk beneath the bottom of the trench, in order to form a species of water reservoir for household purposes. This reservoir is usually located in the part of the building immediately under the kitchens of the various floors, and is in communication with them by means of a bucket attached to a rope which runs over a pulley at the top of the house, so that the occupants of the various stories can draw the water without the necessity of descending to the ground floor. The location of these reservoirs is, therefore, frequently in close proximity to that of the *pozzi neri*, and, from what has already been said of the construction of these *pozzi neri*, it is easily understood how filtration from them must unavoidably reach and contaminate the water of the reservoirs. And the fact that the water trench passes from house to house and directly communicates with the reservoirs explains how, in houses where the *pozzo nero* and the reservoir are quite distinct, the water drawn from the reservoir is often necessarily contaminated by the *pozzi neri* of houses up stream.

Besides this household provision of water, there is also a public supply by means of a comparatively limited number of public fountains in the streets and public squares. The majority of the inhabitants recognise the fact that the water of the public fountains is of a better quality for drinking purposes than that drawn from the reservoir within the houses, and those living on the ground floors, and not too far distant from the nearest public fountain habitually resort to the fountain for their drinking water, using, however, the reservoir water for other domestic purposes. Dr. Shakespeare notes in connection with this practice the curious fact that during the prevalence of cholera in Naples in 1884, and, indeed, in nearly all of the preceding epidemics, contrary to the customary rule in cholera epidemics in most parts of the world, persons dwelling in the

upper stories suffered the most severely from the disease. The explanation of this fact is patent. The ease with which those people could obtain water from the reservoir, and the inconvenience of resorting to public fountains, caused them to use water which was by far the most likely to be contaminated by cholera discharges.

In addition to the contamination of the reservoir water by cholera discharges which might reach the *pozzo nero*, in not a few instances the reservoir water was further contaminated by the reckless practice of washing linen soiled with choleraic discharges in the trenches of running water beneath the houses.

It is difficult to realise the fact that such a system as this—a system which could scarcely be better designed for the most effectual distribution of disease—was to be found towards the close of the nineteenth century in such a populous and important city as Naples. Fortunately, the danger was at last recognised in 1884, and in the following year pure water was brought into the city from a mountain stream—the Serino, eighty miles distant—and was very generally distributed through iron pipes under pressure. At the same time the old system of distribution by water trenches coursing beneath the dwellings was, to a great extent done away with. Neither in 1885 nor in 1886, notwithstanding the existence of cholera in the vicinity, and the not infrequent arrival of refugees from cholera-stricken localities, did Naples suffer from even limited epidemic outbreaks of the disease. This was true also of the year 1887, until, in consequence of a break in the new water conduit from the distant mountain stream, recourse for a few days was had very generally to the old water system. At this time there were numerous refugees in the city, as, in fact, there had been for weeks past, from various places in southern Italy and Sicily, including several suburban towns where cholera was more or less prevalent. Moreover, there were, and had been, almost constantly occurring a few isolated cases of the disease among these refugees without, however, a local epidemic being produced thereby. But very soon after the interruption of the supply of the Serino water there were one or two quite sharp explosions of local epidemics around these cases. The speedy repair of the Serino aqueduct enabled the municipal authorities again to turn on that pure water throughout the city, and, practically coincident with that action the local epidemics, which had occasioned so much alarm, ceased almost as suddenly as they had begun.

It is interesting in this connection to note that there has been a marked decrease in the prevalence of enteric and typhus fevers since the introduction of the new water service into Naples.

The disease reached the city of Genoa in September, 1884, and the severe epidemic which immediately ensued is one of the most interesting and conclusive examples recorded of the spread of cholera by water—by

water, moreover, which was of exceptional natural purity until the moment it received the specific infection.

A few sporadic cases of cholera occurred in Genoa during the first fortnight of September; but immediately following the 21st of that month the disease suddenly and rapidly spread, there being 9 cases on September 24, 52 cases on the 25th, 42 on the 26th, 38 on the 27th, 47 on the 28th, 64 on the 29th, followed by a rapid decline to 59, 40, 22, 21, 23, 22, 12, 13, 10, 5, 6, 3, 6, 2, 5, 7, 0, 1, 4, 4, the last case occurring on October 20. The deaths during the days following September 22 were 2, 2, 18, 32, 27, 37, 47, 30, 19, 25, 28, 20, 22, 17, 10, 10, 13, 10, 10, 10, 3, 6. These figures are themselves very suggestive of a water influence, and this explanation of the epidemic spread was strongly confirmed by the circumstance that, during the early days the disease not only attacked indifferently the poorest and the richest quarters, but was also singularly disseminated throughout the whole city. In the penal Bagno di S. Giuliano, an isolated place where the prisoners are kept in strictest confinement, there were five cases in the first five days of the epidemic, and at the same time the disease made headway upon the heights of S. Benigno at 80 metres above the level of the sea. In every part of the city there were attacks, without distinction of the density of the population, or of social status, or of hygienic conditions or precautions. The dissemination was so general that the first 300 cases were found to be scattered along 158 different streets of the city.

Early in the epidemic a resident physician, an old friend of mine, whose acquaintance I had made when I organised and despatched, with his aid and that of Dr. Wolfe, a convoy of medical succour to the army of Garibaldi on his famous expedition from Sicily, telegraphed to me from Genoa:—"Your water theory of cholera at fault. Genoa has a fine supply of pure water from a high mountain source. Cholera has broken out in districts so supplied, and we have already 100 cases a day. What is to be done?" I replied by telegraph:—"Cannot be at fault; must be water; cannot be anything else. Examine every foot of your water pipes, and trace to the supply pipes' source." Genoa, it may be remarked is supplied by three aqueducts—the Civic and the Galliera, about fifteen miles long, fed by the River Gorgento, and the Nicolay, about thirteen miles in length and supplied by the River Scrivia. An analysis of the first 50 cases of cholera in the city disclosed the fact that as many as 44 were in houses supplied with Nicolay water; of the 50 succeeding cases, 43 dwelt in houses supplied with Nicolay water; and of the third group of 50 cases, 45 were in houses so supplied. In fact, out of the first 300 cases, as many as 93 per cent. inhabited houses in which the Nicolay water was distributed. Further, although the poorhouse of the town is in a very crowded centre, no case of cholera occurred in it, as the authorities of that institution cut off the Nicolay supply. Again, taking the

Via Bianchetti, cases of cholera occurred on the side which was served with Nicolay water, while there was not a case on the other side, which had water from a different source.

Thus the Nicolay water stood convicted, and on further investigation the mystery was readily solved. Near the beginning of the Nicolay aqueduct is the village of Busalla, and at the time in question some hundreds of workmen including, there is reason to believe, many refugees from infected localities, were engaged on a new railroad, and are described as living in the most filthy conditions. Cholera broke out at Busalla on September 14, and several cases thereafter daily occurred until the end of the month. Inquiry disclosed the fact that nearly all the workmen, both the sick and the healthy, had their clothes washed in the Scrivia, or in a tributary of that stream, which supplies the Nicolay aqueduct with its water.

As soon as these facts were known the mayor of Genoa, with very commendable promptitude and decision, prohibited for a time the distribution of the water of the Nicolay aqueduct, or rather the distribution by that aqueduct of the water of the Scrivia. This was done on Septemtember 28. On September 30 the cases of cholera fell from 64 to 59, and, as already shown, during the succeeding days the number of cases suddenly dropped to 40, 27, 22, 21, followed by a rapid decline to *nil* on October 17.

In 1885 cholera occurred in various parts of the mainland of Italy in the provinces of Ferrara, Genoa, Massa, Modena, Parma, Reggio Emilia, Rovego, Trepani, Venice and elsewhere. But the severest visitation that year was at Palermo, in Sicily. Into that town, which has been richly endowed by Nature, but has been rendered most unsavoury by man, the cholera was imported from Marseilles by the steamship Salunto, in spite of the fact that that vessel had been subjected to seven days' quarantine in the Gulf of Assinara. Between August 23 and 25, 1885, a woman living in a little street in Palermo received, for the purpose of washing, a parcel of linen which had been sent to her husband, a sailor on board the Salunto. That woman, after having washed the linen, was seized with vomiting and diarrhœa. On the following day a young woman who lived with her developed the same symptoms, as did also several other women in the neighbourhood during the next few days. On September 13 there were 13 cases and 4 deaths; on the 14th there were 13 cases, on the 15th 7 cases; but on the 16th the number of cases suddenly sprang to 36, on the 17th to 132, on the 18th to 221, and on the 19th to 258. From that date the disease began slowly but gradually to decrease until the middle of November, by which time 5,535 cases and 2,959 deaths had occurred in Palermo among a population of about 275,000.

The opportunities for the spread of the disease, when once introduced into Palermo, were very similar to, though much more pronounced than

those in Naples. The water supply is brought from the surrounding hills, usually in open trenches of masonry. Within the town these trenches are sometimes uncovered, or they pass beneath the houses, in the basements of which there are traps in the top of the water trenches for the purpose of enabling the water to be taken from them direct. There are also a number of public fountains throughout the city supplied by this running water, and there are many wells exposed to all the most filthy contamination. The washing of clothing is very common in the water trenches, both before and after the city limits are reached.

The habits of the people are of the most filthy character, and in the presence of the cholera the ignorance and superstition of the populace greatly harassed the authorities, and increased their difficulties. It is owing in great measure to the enlightened and vigorous action of Dr. Albonesi, who was appointed director of the local sanitary council, that the early termination of the epidemic is mainly due. That Dr. Albonesi thoroughly understood the methods by which cholera spreads is shown by an eloquent pamphlet which he published shortly after the epidemic on the duties of governments and countries during epidemics. He directed the closing of all wells in the affected localities, and inaugurated thorough cleansing operations of all kinds. The closing of the wells was followed by the decline of the epidemic. On his advice also the boiling of the water before use was very generally adopted by the more intelligent inhabitants, and with marked benefit as regards their immunity from infection.

I have only given details of the three greatest outbreaks in Italy in 1884–85, but every community throughout the country that was attacked by the disease taught the same lessons.

(E) SPANISH EXPERIENCES.

In 1885 Spain was the seat of a cholera epidemic of exceptional ferocity, which, having sprung from a few initial imported cases, rapidly embraced the greater part of the peninsula. There is, unfortunately, little sign at present that Spain herself has profited from her terrible lesson, but for those who wish to master the mysteries of cholera, the Spanish epidemic of 1885 illustrates clearly the futility of so-called quarantines, both on sea and on land, and the potent agency of rivers and streams, once infected, in spreading the disease for long distances, when the population living on their banks drink their waters.

The earliest cases of cholera occurred in Alicante, on the south-east coast, towards the end of August, 1884. There is, as usual, some conflict as to the exact manner in which the infection first reached Spain. According to one account, a family of Spaniards returning from Marseilles was responsible. That family sailed from Marseilles to the French province of Oran, on the northern coast of Africa, where they procured

transport for themselves and for their personal effects to a maritime village near Alicante. They successfully evaded the surveillance of the Spanish quarantine officers, and carried, it is thought, the germs of the disease with them. According to another version, the disease was brought by a vessel from Algiers, which, after performing a week's quarantine at Alicante, proceeded to land her passengers. Among the latter was a family from Cette, which took up its abode in the house where cases of cholera subsequently appeared. During the third week of September isolated outbreaks occurred in the province of Tarragona, also bordering on the Mediterranean, and in the neighbouring provinces of Lerida and Saragossa. Later on, in November, cases cropped up in the coast province of Valencia and in the inland province of Toledo.

The disease slumbered through the winter around Gandia, in Alicante, and in the following April broke into an epidemic at Játiva and Alcira. From these quarters the disease was soon carried far and wide by the labourers, who usually disperse in May from the rice plantations of Valencia. Henceforward sanitary cordons and such like measures failed to stay the march of the epidemic—indeed, in some instances, they seem to have had the contrary effect. Without attempting here to follow that march step by step, the result may be summarised from a tabular statement issued in May, 1886 by the Spanish Minister of the interior. It appears that between the first cases of the disease notified on February 5 in the province of Valencia, until the last cases notified on December 31, 1885, in Salamanca and Cadiz, 2,247 local governments ("ayuntamientos"), included in 46 provinces, and having an aggregate population of 6,576,641, had been invaded, 338,685 cases and 119,624 deaths having occurred among them. The population which escaped the scourge is stated to have been 10,396,839, distributed among 7,067 local governments.

Sanitation and domestic hygiene are of a very primitive description in Spain, if indeed they can be said to be at all regarded by the bulk of the population. The streets and roads of the towns and villages, and the back yards of the houses are, without any consideration for decency or health, made the depository of nearly all the fæcal and other filth of the population. The dwellings of all but the wealthiest are old and unwholesome, with frequent accumulations of filth close beside them; and drainage properly so-called may be said to be non-existent, only a very few of the largest towns possessing any system of drainage whatever.

The open rivers and streams are the usual sources of water supply, and in Valencia and some other provinces the open agricultural irrigation canals serve also for the domestic supplies. But these rivers and canals too often serve as public sewers, and, as in France and Italy, the washing of clothes is usually performed in them. In some cities and towns there are also wells; but apart from their being sunk in a recklessly polluted

soil, there is seldom any attempt made to protect those wells against infiltration of the filth which so often surrounds them. In Murcia and Andalusia there is still the old Moorish custom of storing water in huge earthen jars. These jars are sometimes to be found ranged around the house courts, reminding one of tales of the Arabian Nights; but often they are sunk beneath the floor of the yard, where they are in close proximity to the *cloaca negra*, or cesspit of the establishment, and are liable to receive the overflow or soakage from it. These *cloacas negras*, it may be added, when they exist, receive all the fæcal and other filth of the household, and their contents usually soak away into the surrounding soil.

In a work published in 1886 on cholera in its relation to water,[a] Mr. George Higgin has dealt very clearly with the Spanish epidemic of 1885, and by comparative pictures of the circumstances of several typical towns, he has graphically and conclusively shown that it was *par excellence* a waterborne epidemic that, specifically infected, more than any other unwholesome circumstance, was the cause of the fearful mortality and misery which then spread throughout the length and breadth of the peninsula. He shows that this formidable disease never became truly epidemic or dangerous in any Spanish city in which there was a pure and good supply of water, and where proper means were taken to guard against the sources being polluted by any of the specific choleraic poison. He shows how, in this way, the cities of Toledo, Seville, Malaga and Madrid escaped comparatively lightly, while such places as Aranjuez, Saragossa, Granada and Valencia suffered very severely.

Taking Madrid, it is noticeable that out of a population of 397,816, there were only 2,207 attacks and 1,336 deaths, or barely as many as occurred in a couple of days in the previous epidemic of 1865. The water supply of the town is derived from the Lozoya river among the Guadurama mountains, and was completed shortly before 1865. The greater part of the drainage was also then completed, but at the time the new water supply had scarcely come into use, the large majority of the houses being supplied from the old fountains which existed in various parts of the city. During the last twenty-five years the use of the Lozoya water has become very general, and an ample supply has been provided for washing the streets and flushing the sewers. Madrid is well drained, but the means of disposing of the sewage is very unsatisfactory.

When the existence of cholera in Madrid was recognised in 1885, one of the first acts of the municipality was to attend to the water supply. There existed 11 ancient sources which supplied 85 taps or fountains, 22 of which were public, and at which water carriers were allowed to fill their barrels, while the remaining 63 belonged to groups of houses. In spite of the excellent supply brought in from the Lozoya, these old sources

[a] Cholera in its Relation to Water Supply. By George Higgin. 1886.

were still a great deal used by the inhabitants—many, from old habit, preferring to use the same water which their fathers had used, while many were not willing to incur the expense of laying on the new supply. In view of the impossibility of effectually guarding against the possible contamination of some of these sources of supply, the municipality by degrees closed all of them except one. The central government undertook the custody of the Lozoya aqueduct, and during the whole time of the existence of cholera in the city the uncovered portion of that aqueduct was patrolled by armed guards, no one being permitted to approach it without special order. There is every reason to attribute to these energetic measures the comparative immunity of Madrid from cholera during the epidemic of 1885. Such cases of the disease as did occur in the city seemed to be associated not with the water, but with the outfalls of the sewers around which they seemed to cluster.

Toledo, the ancient capital of Spain, now having a population of about 20,000, differs widely from Madrid, its sanitary arrangements being much worse. It was supplied with water from the river Tagus, which flows around the city, the water being lifted by pumps. Above Toledo, on the same river, is situated Aranjuez, and above that town again, on the Manzanares, which is a feeder of the Tagus, is situated Madrid. In both of these latter towns cholera existed in 1885, being unusually severe at Aranjuez. The Governor of Toledo, recognising the suspicious character of the water, promptly stopped the pumps and obliged the inhabitants to send for their drinking water to a distant spring, and even forbade anyone to bathe or wash clothes in the river. The measure was a strong one, but it saved the city, for there were not more than 200 cases there during the epidemic.

Next, Mr. Higgin points to Seville, the third city in Spain, with a population of 134,000, and with very bad sanitary arrangements. There is no proper drainage, and the city is not healthy. The town, however, possesses an excellent and well protected water supply. But one of the suburbs of the city called Triana, containing about 30,000 inhabitants, is situated on the western side of the river Guadalquiver, which is fed by the rivers Darro and Genil, which flow through Granada, and the poor in this suburb drink generally the water of the river. The Seville authorities, however, in good time prevented the use of any water from the river, either for dietetic or other purposes. The result was that Seville practically escaped the disease, although it raged fearfully in Granada, higher up the river, and descending the river Genil, which runs through Granada, attacked the towns of Herera, Ecija, and others in the province of Seville. It broke out also at Cordova and other towns on the Guadalquiver, of which the Genil is an affluent, and it appeared in Palma, Utrera, Puerto Real, Puerto Santa Maria and Cadiz, forming a circle around Cadiz, but the city itself escaped almost completely. Xerez, which lies between

Seville and Cadiz, and possesses an excellent water supply, also escaped the disease. Malaga, which is in a bad sanitary condition, except that it has been provided with an excellent water supply, also escaped very lightly.

Taking now some towns which were severely visited by the cholera, it is seen that Granada, with a population of 76,000, has bad sanitary arrangements, only a tithe of the houses being drained. The water supply is from the Genil and Darro rivers, to which we have already referred. A small portion is supplied from a spring. The canals carrying the water from the rivers are uncovered and exposed to all kinds of contamination. The cholera broke out in July, spread with frightful rapidity, and by the middle of August over 450 cases a day were officially recorded. No attempt had been made, as at Toledo, to suppress the old water Supply. From Granada the course of the cholera may be followed down the rivers Darro and Genil, the infected waters carrying death wherever they were used for drinking purposes.

Murcia, with a population of 91,000, from which the cholera was imported into Granada, suffered heavily also. The disease was carried into the plains of Murcia by the waters of the river Segura from the baths of Archena, it having been imported into Archena by some invalid soldiers from the infected districts around Valencia. The plain of Murcia is irrigated by the waters of the Segura, and the disease commenced in this district with the death of a labourer who had drunk the water of one of the irrigation canals. The epidemic raged principally among the little cottages scattered thickly over the plain.

According to Mr. Higgin, no case in reference to water supply is so instructive as that of the town of Valencia. This city is fairly well drained, as drainage goes in Spain. The water supply is derived from the river Turia, is passed through sand filters, and is stored in a covered reservoir. When cholera broke out in the spring of 1885, it came very near Valencia, but did not touch it. At last, in the middle of May, having crossed the water supply of the city, and thoroughly infected the river, it fiercely attacked Valencia, and by the end of June the number of cases had risen to 700 a day, among a population of 143,000.

The experience of Saragossa is also instructive. Its principal water supply is derived from the Aragon canal, which in its turn is fed by the Ebro, near Tudela. The water became infected, the disease broke out in Saragossa, and some 10,000 cases occurred among a population of about 84,000. The preventive measures adopted by the authorities unfortunately came too late. These cases could be multiplied almost indefinitely, and the same lessons be learned from them.

(*To be concluded.*)

THE PREVALENCE OF TYPHOID FEVER IN DUBLIN.

(*Continued from Page 254 and concluded.*)

Report on Bacteriology of Typhoid Fever. By Professor M'Weeney.

There is now no doubt that typhoid fever is caused by micro-organisms which enter the body usually through the mouth and multiply in the intestines. These micro-organisms attack certain parts of the intestinal wall, and force their way or are absorbed into the living tissues. They spread to the mesenteric glands, spleen, liver, and kidney, and, after a struggle with the active cells or *phagocytes* of the human body, are usually destroyed and consumed. While this struggle is going on, the micro-organisms disengage from themselves poisonous matters which produce general disturbances of function, especially of heat-regulation, which we agree to term *fever*. Their presence in large numbers in a given part also produces disturbance of nutrition in that part, which may lead to actual necrosis or death of the part. Thus are produced the intestinal ulcerations so characteristic of the disease in question.

Up to quite lately it was thought that the micro-organisms which produce typhoid fever are of one kind only, and as this kind is of a rod shape, and was first described (1880) by Eberth, it is known as *Eberth's Bacillus*. (Bacillus means a little rod.) These bacilli are always to be found in the dejecta of typhoid patients and in their internal organs after death. They are supposed to get from one patient to another and thus spread the disease. They do not, however, seem capable of doing so directly, they require to live for some time *outside* the body before becoming capable of transmitting the infection. This interval is naturally spent in the places where dejecta are thrown, viz.—sewers, cess-pools, &c.

Lately it has become known that typhoid, or, at all events, a disease so closely resembling typhoid as to be undistinguishable from it, is produced by another kind of micro-organisms closely resembling Eberth's Bacillus, but differs from it in this, amongst other characters, that it is normally found in the bowels of every healthy person—even in those of children at the breast. Eberth's Bacillus, on the other hand, is only found when typhoid fever is present. Those who say that this second kind of micro-organisms, or, to give it its proper name, *Bacillus coli communis*, is the cause of typhoid, if asked why it is that it lives in so many people's intestines and does them no harm, reply that it must first spend some time in the liquid water-diluted fæcal matter of the sewers before it becomes capable of originating typhoid fever.

The main point of interest to practical sanitarians in this discussion is, that whether it be Eberth's Bacillus or the *Bacillus coli communis* which causes typhoid, *the essential feature of the infection is that it can only be produced by germs which have festered for some time in the corruption of the sewer. The problem of preventing typhoid thus resolves itself into that of preventing our food and drink and air from coming in contact with sewer-material and sewer-air.* It is exceedingly probable that the typhoid-producing microbes are not equally at home in all kinds of sewer filth. They do not flourish in semi-solid heaps of fæcal matter, such as the contents of privies, but are speedily reduced in vitality and killed. On the contrary, they thrive exceedingly when the fæcal matter is well diluted with water. This is accounted for by the unquestioned fact that typhoid is especially prevalent in places where the water-carriage of fæces is the established system.

The bacilli swarm in the numerous places where the filthy water is allowed to stagnate and acquire the virulence which enables them to produce typhoid when they get into the human alimentary canal. This they may do in various ways—notably, as I think, through the contamination of food-stuffs—above all of milk—by gaseous sewer emanations obtaining admittance to pantries, larders, &c.

The facts just stated have been gained at the cost of much labour by the bacteriologists. How is the sanitarian to apply them? As follows:—

First.—Disinfect all typhoid stools and linen.

Second.—Keep sewer emanations out of your houses, and *above all out of your larder.*

Third.—Mind your water supply; boil milk and water before use in epidemic times.

Fourth.—Keep yourself in good condition, remembering that disease germs can attack only a *lowered* constitution.

Fifth.—Expose the sewer water to direct sunlight in a thin layer for two hours. *All* germs will be killed. Five hours in diffuse daylight will do the same. Buchner has lately found that two hours in the sun will kill any disease germs. You will thus do away with such numbers of disease germs that if typhoid be caused by a *specific* germ proper to itself, a great diminution in its incidence might fairly be expected were this plan of treating sewage adopted.

Report on Water Supply of Dublin. By Professor Emerson Reynolds and Dr. C. J. Nixon.

It is generally admitted that contaminated water is frequently the means by which the virus of typhoid fever is distributed throughout a community, hence a necessary part of our inquiry consisted in an examination of the purity and general condition of the Vartry supply to Dublin.

It has been contended of late that the protection of the great reservoir at Roundwood from the sewage of the town is now inadequate, and that the filter beds are, or recently were, in an unsatisfactory state; but these adverse criticisms have been formerly discussed and replied to by the Corporation of Dublin. We do not propose to intervene in that controversy, since to do so effectively would involve a much more complete investigation than we have any authority to make. Hence we have confined our examination to the condition of the water as recently delivered from the street mains in Dublin.

One of the members of this Committee has subjected to careful analysis the Vartry water as supplied direct from the street main at Lincoln-place to the Chemical Laboratories of Trinity College on twenty days, between the 22nd of January and the 24th of February, 1892 (*vide* Statement of Analysis of Sub-soil and Well Water, at end).

The general results obtained are in accordance with all previous analyses made at the same point, and prove that the Vartry water is often, for a considerable time, of exceptionally high purity, but that it is liable to comparatively rapid alterations of quality which have only been detected by almost daily analyses.

The products obtained by analysis from water, which are of chief significance in judging its organic purity, are "Ammonia" and "Organic Nitrogen"; hence, for the sake of clearness, all other substances are excluded from the following Table (p. 326).

The results are stated in grains per imperial gallon of the water taken direct from the street main. The colour each day and degree of filtration are also indicated by numerical values explained at the foot of the Table.

The analyses prove that the Vartry water was in remarkably good condition on the 22nd of January, 1892, and that it continued so until the 26th. On the latter date there was a sensible declension in quality, and on the following day the highest proportions of both "ammonia" and "organic nitrogen" were obtained, while there was no apparent increase in peaty matter. The organic purity on the 27th was distinctly low; but, two days later, the water was again in good condition, and from the following Monday (February 1st) has since been analysed on fifteen days with results which were in most cases satisfactory.

It is evident that the remarkable purity of the water on the greater number of occasions when it was subjected to critical analysis is not consistent with the view that the Roundwood reservoir is liable to constant sewage contamination. On the other hand, the variations in quality detected in this, as in former series of analyses (and not connected with the presence in excess of peaty matter in solution), indicate that such temporary contamination may have been due to causes at work within the area of distribution of the high pressure water supply.

Amongst these causes may be mentioned the replacement of burst pipes by new ones imperfectly cleansed before laying; and the faulty action of street valves, shown by Mr. Wigham to be quite capable of permitting the occasional introduction of foul matter into the water.

The foregoing observations apply only to the Vartry supply taken directly from the street main; but the storage cisterns in houses are often so placed as to lead to the serious contamination of the water. It is by no means unusual to find the cistern of a closet the source of some at least of the drinking water used in a household, although the surface is known to be freely exposed to gaseous and other exhalations of more or less injurious character, while its overflow pipe is often connected directly with the sewer. We have also analysed Vartry water drawn for drinking purposes from imperfectly protected cisterns placed near the steps and in the areas of houses, and, in several instances, such samples were found to be polluted to a very serious extent. Attention was directed to these sources of danger by a member of the Committee shortly after the introduction of Vartry water into Dublin.[a]

Vartry Water—Tabular Statement of Analyses.

No. of Sample	Date, 1892	Colour [b]	Filtration [c]	Ammonia, grains per gallon	Organic Nitrogen, grains per gallon
1	January 22nd	1	1	0·001	0·009
2	,, 26th	2	2	0·002	0·011
3	,, 27th	1	2	0·005	0·015
4	,, 29th	1	2	0·001	0·009
5	February 1st	2	2	0·001	0·011
6	,, 8th	1	1	0·001	0·006
7	,, 9th	1	1	0·001	0·005
8	,, 10th	2	2	0·002	0·011
9	,, 11th	3	1	0·002	0·009
10	,, 12th	3	1	0·001	0·007
11	,, 13th	2	2	0·001	0·007
12	,, 15th	3	2	0·001	0·006
13	,, 16th	2	2	0·003	0·007
14	,, 17th	4	3	0·001	0·009
15	,, 18th	1	1	0·001	0·005
16	,, 19th	2	2	0·001	0·009
17	,, 20th	2	2	0·001	0·010
18	,, 22nd	1	1	0·001	0·009
19	,, 23rd	1	1	0·001	0·007
20	,, 24th	1	1	0·001	0·006

[a] See memorandum by Professor Emerson Reynolds, page 163 of Commissioners' Report. (Royal Commission, 1879–80.)

[b] Under *Colour* the value "1" indicates *least coloured*, and "5" highest of usual range.

[c] Under *Filtration* the value "1" indicates *very good*, and "5" sensibly turbid.

The general results may be thus summarised:—

A large proportion of the twenty samples of Vartry water analysed on the dates specified proved to be well filtered and of high purity, the latter condition being inconsistent with constant pollution at the source. But on several occasions comparatively rapid variations in quality were detected by daily analyses, and on one day, January 27th, the water was in a distinctly unsatisfactory condition, probably owing to local and preventable causes.

Report on Dairy Yards. By Mr. Jonathan Pim.

The Royal Commission of 1879 received some slight evidence as to the condition of dairy yards in the city of Dublin, and in the summary of conclusions with which the Commissioners wound up their Report they said "that cow-sheds and dairies are in improper places within the municipal area, and that some of them possess no adequate appliances for drainage, cleanliness, and ventilation." It was not until the year 1887 that the Corporation of the City of Dublin drew up rules, under the powers given them in that behalf by the Contagious Diseases (Animals) Acts, 1878 and 1886, for the regulation of all dairy yards within the municipal boundary. These rules, if they were properly and strictly enforced, would be sufficient to obviate many of the dangers to the public health arising from ill-kept cow-yards and sheds. They provide for the registration of all persons carrying on the trade or business of a cow-keeper, dairyman, or purveyor of milk, and for the proper inspection of the premises, and they contain important regulations as to the inspection, cleansing, lighting, ventilation, drainage, water supply, &c. There is also a rule forbidding cow-keepers and dairymen to permit any one suffering or recovering from any infectious or contagious disease to milk cows or to sell or deliver the milk or in any way to assist or take part in the business of such cow-keeper or dairyman.

There is no conclusion arrived at by sanitary science during recent years more firmly established on unimpeachable testimony than the fact that of all media for spreading infection milk is one of the most potent. Again and again outbreaks of typhoid and other zymotic fevers have been traced with absolute certainty to the milk supply of the neighbourhood, and it has been shown that some one connected with the cow-yard or with the dairies proper has been suffering from the fever which has thus spread.

The regulations above referred to are quite sufficient to insure such cleanliness if properly carried out, but, as a matter of fact, they are not. There are cow-yards in Dublin which are a disgrace to the city, and are a source of danger to its inhabitants. Scattered both on the north and south side of the river are to be found small yards, dirty, undrained and

unpaved; sometimes with great heaps of manure close up to the reeking unventilated sheds in which the cows are housed. It is almost impossible to arrive at the exact number of these yards, as many of them are small enough to be hidden away behind houses in densely crowded districts, but there are at least over 500 of them. Now, even if the yards were properly kept, it cannot but be dangerous to have them located in such places where the dust and sweepings of all the neighbouring ill-kept tenement houses are constantly being blown across them. Milk left to stand ever so short a time in such places may become contaminated. These yards, however, are, as a rule, kept in a condition of horrible filth. On account of the want of proper drainage they are never dry, and from the heaps of rotten manure sometimes a reeking stream of offensive matter flows down towards the cow-sheds. Even where the yards are well kept, they are sometimes in places which make them dangerous to the public health. One of the best kept yards in the city is to be found in Marrow-bone-lane, but right over it towers the great heap of refuse in the Corporation depôt, and it must often happen that when the wind is blowing towards the dairy yard particles of the filth deposited there by the Corporation carts fall into the yard, and into the milk. This refuse heap is daily added to from the houses of the city. Again, right under, indeed almost against, the walls of both the Cork-street and Hardwicke Fever Hospitals are to be found a large number of yards containing hundreds of cows. It is conceivable that there is some risk of the milk becoming contaminated from such close proximity to these great fever centres.

In very few of the yards which we visited have the cows at all sufficient standing place. In many of them it is impossible for the animals to lie down beside each other, and consequently their condition of filth is more easily imagined than described. By the By-laws of the Corporation the owners are bound to keep the animals clean, but, as far as we have seen, many of the cows in these and in numerous other yards have not been washed or brushed for months. May it not happen that some particles of the fæcal matter, with which the sides of the cows are caked, may fall into the milk cans?

In very many yards the floors of the sheds are as low as, if not lower than, the yards themselves, and there is absolutely no drainage. As a rule, the yards are unpaved and full of manure water, and large heaps of rotting manure are heaped up in corners, often against one of the sheds. It is impossible to speak too strongly of the condition of filth of every-thing in some of the smaller yards. In one, in the neighbourhood of Summer-hill, there was a privy up against a shed in which were some fifteen cows. In the midst of the abominable filth of these yards are generally to be found the tubs in which the grains for the cattle are prepared. These tubs are sunk in the ground, and there must be great

difficulty in ever getting them properly cleansed. How the men who tend and milk the cows are to live cleanly under such conditions it is hard to understand, but, as a matter of fact, no such pretence is made, and, taken all round, the workmen whom we saw in these yards did not contrast too strongly with their surroundings.

It is impossible within the limit of this report to give greater details of the condition of the Dublin dairy yards. If there were efficient inspection the conditions of things which we saw could not exist.

Report on Sewer Gas. By Mr. Thomas Drew and Dr. Graves.

Unsanitary conditions exist in nearly all the low-rented suburban houses in Dublin. We can say from experience that in many houses in such districts as Rathgar and Rathmines sanitary arrangements have been found which are both barbarous and dangerous.

The following conditions may be found in almost any house taken at random:—

1. That evil institution, the Dublin scullery sink, under the hall door steps is directly connected with the main drain. It has a useless metal bell-trap, which is generally loose, or it has long had it removed altogether.
2. The worse than useless bell, or D traps, are found in the yards and areas, and under windows. Dublin tradesmen may be found any day still fixing these obsolete and illegal contrivances as if sanitary by-laws had never been framed.
3. A disconnecting trap—a first essential of sanitation—is the exception and not the rule.

In the cheaper-rented houses, the one soil-pipe of the house is, as a rule, unventilated at either top or bottom. It is more frequently inside the house than outside. It is frequently brought down through a pantry or larder, and is of cast iron, with open joints. It has almost invariably the worst and foulest description of old pan closet attached, and either an insufficient or no flushing of water. These evils are not confined to the low-rented suburban houses; many high-rented ones in the city are in no better sanitary condition.

We have cognisance of numerous cases of typhoid fever arising from the defects we have indicated. They point to the conclusion that it is necessary that the Sanitary Authority should have the inspectorial powers, and should be enabled to enforce the adoption of efficient safeguards.

Causes other than those Referred to in Preceding Sections. By Dr. Stewart Woodhouse and Mr. Edgar Flinn.

Typhoid Fever may be distributed by the following means:—

1. The atmosphere.—There are abundant instances where water, milk,

and sewerage have been investigated in vain, and no other unsanitary condition is traceable, save that cases of the disease have existed in the immediate neighbourhood, and the inference suggests itself that the germs have been carried by the air from infecting foci. When typhoid fever makes its appearance in institutions isolated from ordinary intercourse, but in proximity to habitations where it exists, the possibility of air-borne contagion must present itself when other modes of access can be excluded.

2. Infected clothing is another of the less generally recognised means of communication. In many households the importance of soaking the soiled linen of fever patients in disinfecting fluid is not known. When this is neglected there is no security against the diffusion of infection through the laundry save whatever is afforded by the heat of the water they are washed with. In the case of death the distribution of the clothing among the relatives or by sale may likewise convey a legacy of poisonous germs.

3. Faulty disposal of infected excreta. This error may be committed in various ways—(*a*) By leaving the excreta too long before disinfection and removal. The discharges are less harmful when fresh, but become dangerous from a fermentation process occurring in them after a period of about twelve hours. (*b*) By throwing the infected excreta on manure heaps, privies, street channels, or the surface of the ground; or (*c*) By disposing of them in any way (usually by means of water-closets used by other occupants of the house) without proper admixture with a disinfecting agent. The public require information as to the suitable kind and strength of the disinfectants, the proportion in which they should be used, and the necessity for their being thoroughly mixed with the excreta.

Report on Drainage System of Dublin. By Mr. Thomas Drew and Dr. Graves.

Sewers and Drains.—On looking into the history of the Dublin Sewers we find it stated in the Report of the Royal Commission, 1879–80, that the old sewers had been formed from time to time without any reference to a general plan, and of the roughest materials, and, as a rule, not true either in line or in gradient. Much credit is given in the Report to the Corporation and their Engineer for the extensive improvements carried out up to that time, but a sewerage system could not be as perfect under such circumstances as one planned in more recent times for a new city on a definite system. When the new sewers were constructed in the streets, the old house drains were in most instances led into them, and were cut off from the old sewers into which they formerly discharged, but in a number of cases the house drains continued to discharge into the old sewers. It is, in our opinion, most important to investigate where such old, forgotten, and partially disused sewers still exist. A searching

examination is also required into the existence of forgotten cesspools, as well as disused sewers, in such localities as Grafton-street, College-green, Dame-street, Westmoreland-street.

Sewers, in the lower levels of Dublin, under the influence of the tide, back up and leak through cracks and connecting drains, especially during heavy rains occurring at the spring tides; but we are glad to think that this heretofore one of the gravest dangers to the health of Dublin will, under the remedial effect of the now contemplated main drainage system of the Corporation, soon become an experience of the past. Some sewers away from the influence of the tide, with defective gradients, become receptacles for deposits of filth, and have to be cleansed by laborious dredging and bucketing by hand. These sewers must be looked upon as specially dangerous to health both in their congested state and during the process of cleansing. There has been a widespread measure of improvement in the sanitation of Dublin houses since 1880, yet there is abundant evidence that a vast number of the house drains are still in much the same condition as they were when described in 1879—as saturating the basement sub-soil with sewage. In many instances which have come under our notice, the introduction of pipe drains has, by reason of the careless manner in which they were laid, only given a false sense of security to the householders without in any way preventing the saturation of the sub-soil.

Mr. Maguire's report on the subject of typhoid fever, which contains a very clear statement on the subject of connecting drains, having been adopted by the Corporation, there is no need for us to enter into the subject of the defective condition of these drains.

We submit that it is useless to deal in any wholesale way with connecting drains, which really affect the street more than the basement sub-soil, while the house drains themselves are in their present condition. There is no doubt that a large proportion of the house drains in Dublin are built, and are therefore illegal, and of the rest we think that only a small number would stand testing in a thorough manner. It is more important for us to suggest a practical remedy by means of legislation in the form of enlarged powers to the Sanitary Authority for dealing with such evils.

We are of opinion that in Dublin, as in all the suburban townships, it would be a right thing that the Sanitary Authority should be notified of any change of tenancy or occupation of a house, so that a thorough testing of the drains might then be instituted by the Sanitary Authority in order that the new occupant should have a guarantee of the safety of the drains of the house. This notification of the change of occupancy should be compulsory on the landlord. The Corporation should have a sanitary staff to carry out such investigations independently of any investigation which the landlord or occupiers might think fit to make.

We further think that it would be advisable to institute, at any time, a compulsory house-to-house inspection in every street or square in which in two consecutive years more than two houses supplied cases of typhoid fever, with a view of ascertaining the cause of such outbreak, as distinguished from faults in a particular house.

All streets or squares, however, have not got the same sewer throughout their entire extent. Therefore it would perhaps be better, if possible, to arrange the house-to-house inspection on the section of the sewer in connection with the houses in which the cases of typhoid fever had occurred. We have ascertained that in most cases of the recent epidemic of typhoid fever in Dublin, the drains, when properly tested, were found to be faulty.

We think that it is most important that where house drains are tested by the Corporation, the connections between the street sewer and the house drains should also be properly tested and reported on. When we mention the testing of drains we refer to the water test, the smoke test being, in our opinion, unreliable for covered drains, though it may be useful in showing rat-holes, &c.

REPORT ON SUB-SOIL SATURATION.

Ground Water from Tides, Springs, and Disused Wells. By Mr. Thomas Drew and Dr. Graves.

We have gone carefully into the question of ground water, getting samples from wells, used and unused, from various parts of the city. We found on testing the water that most of the samples were polluted with sewerage, some of them to a very great extent (*vide* Statement appended). Two of the wells, however, which were very deep, and were being constantly used, were quite pure. The wells were in most instances full of water up to within four to six feet of the surface. We think it is self-evident that the constant danger arising from a high level of sub-soil water in a city in which the sub-soil is, and has long been, admittedly sewage polluted, makes it imperative on the Sanitary Authorities to take such steps as will remove this potent factor in the causation of typhoid fever in Dublin.[a] This can be effected on the higher levels only by a separate system of drainage, and in the low levels by pumping the water out of the sub-soil, as Trinity College has been forced to do daily since the introduction of the Vartry supply flooded it.

After a careful survey of all the evidence, we find that the level of the sub-soil water is now at a very high point.[b] In some places in the stiff

[a] It must not be forgotten that the leaking sewers and drains have leaked out sewage containing typhoid germs into the sub-soil. Therefore it is easy to understand how a high level of ground water is particularly dangerous in Dublin.

[b] February, 1892.

clay this is not so, but, on the other hand, the exclusion from the house drains, connecting drains, and sewers, of the water which leaks through the street surface, keeps the basement of the houses on clay constantly moist.

The high level of sub-soil water generally is caused by :—

1. *Heavy Rains.*—The past winter has produced floods in various parts of the city by reason of the heavy fall of rain; this flooding has been very marked at the bottom of Grafton-street. The Provost's House at the one side and nearly all the houses at the other side had their basements flooded. A similar flooding and saturation of the foundation a few years ago caused the fall of a house opposite the Provost's (the Trinity College pumping engine gradually drains away these floods from the bottom of Grafton-street).

2. *Tide.*—The spring tides flood the basement of many houses on the gravel area. We have been into cellars which have two feet of water in them at spring tides. This water is full of foul matter, and must tend to impregnate the basement sub-soil with filth.[a]

3. *The Cessation of Pumping of the Wells in the City since the Introduction of the Vartry Water Supply.*—There is the clearest proof that the disuse of pumps since the introduction of the Vartry has, by reason of the overflow of wells supplied by springs, raised the level of the ground water in Dublin. The level of the water in many wells is constantly as high as it can be, the water in them rising until the loose soil near the surface enables the surplus water in the well to escape by leakage into the sub-soil.

4. *The Exclusion of the Sub-soil Water from the Sewers and Drains.*—The exclusion of the sub-soil water from the sewers and drains (which were originally constructed to carry off surface and sub-soil water) is becoming daily more complete as sewers and drains are made watertight. As no adequate drains have been provided for the escape of this water it will, unless a separate system of drainage is provided for it, become a still greater danger to the public health than it is at present.

5. *Waste Vartry.*—Instances of the Vartry water leaking into the sub-soil can be seen in almost any street.

In conclusion, we wish to remark that experience elsewhere has proved that lowering the level of a filth-polluted sub-soil water has led to a great diminution of the death-rate, not only from typhoid fever, but phthisis,[b] and that Dublin may reasonably be expected to benefit by the removal or lessening of the malarial influence which lowers the health and vitality of so many of its inhabitants. Dublin, properly sewered and drained, should take a high rank as a healthy city amongst the large cities in the

[a] It has recently been noticed that when the Danube floods Vienna, the flooding of the house cellars causes an outbreak of typhoid fever.

[b] Strahan. Dublin Journal of Medical Science. November, 1892. The High Death-rate of Irish Towns and its Causes.

British Isles. It is worthy of note that in Dantzig, formerly a pestilence stricken city, *the typhoid fever death-rate was not appreciably affected by the new water supply*, which was completed in 1869. It was not until the new sewerage was completed in 1872 that the typhoid death-rate showed much improvement, the rate averaging 9·9 per 10,000 for a period of years previous to the new sewerage (it was 11·0 in 1871). The improved drainage in 1872 pulled down the rate to 2·9 for the next ten years, while it has fallen to 1·5 for the last six years.[a]

Statement of Analysis of Sub-soil and Well Water.

Date, 1892	Designation	Condition	Nitrates	Ready formed Ammonia, grs. per gallon	Organic Nitrogen, grs. per gallon	
January 29th,	College-green,	Brownish, turbid,	Traces,	0·133	0·016	Very bad
February 9th,	Deep well, kept constantly pumped, Merrion-square	Good, . .	None,	0·002	0·003	Very good
Do. 28th,	Bank of Ireland	Good, . .	None,	Traces	0·003	Very good
Do. 26th,	Up. Ely-place, kept constantly pumped,	Slightly turbid,	None,	0·004	0·005	Fairly good
Do. 26th,	Erne-street,	Turbid, bad,	Traces,	8·084	0·070	Very bad
Do. 29th,	Merrion-square,	Nearly clear,	None,	0·006	0·010	Little contaminated
March 11th,	Custom house, under area of housekeeper's quarters	Very turbid, slightly briny,	Large quantity,	0·028	0·121	Very bad
Do. 11th,	Custom house, surface soil, area of Assay Office,	Turbid, .	Much,	0·018	0·280	Very bad
Do, 16th,	Henry-street, well, constantly used,	Slightly turbid, with fungoid growths,	None,	Traces	0·0196	Unwholesome

CHOLERA.

THE *Gazette Médicale de Paris* notes an observation of M. Girode's that cholera and enteric fever may succeed each other in the same subject without apparent interval. M. Gaillard had already reported two similar cases. The fact seems to indicate a common origin of the two diseases. The *Gazette* also notes a caution of M. Girode's as to the use of certain drugs in the internal treatment of cholera. Salol, for instance, which has been recommended on account of its supposed antiseptic properties, is not always absorbed from the stomach, may accumulate there, and induce intense irritation, and even inflammation.

[a] Centralblatt für Gesundheitspflege. 1885. Erster Heft.

THE OXYGEN SEWAGE PURIFICATION PROCESS.

A DEMONSTRATION of this process took place at the Central Criminal Lunatic Asylum, Dundrum, Co. Dublin, on the afternoon of Thursday, August 31, 1893, in the presence of a large number of professional men and others. In explaining the process, MR. W. E. ADENEY, Curator in the Royal University, said:—

You will, I think, more easily understand the process of sewage disposal and purification, which we are about to inspect, if I try and explain the scientific principles on which the treatment is based.

Speaking generally of the great problem of the purification of water-carried sewage, it is only recently that the true principles, upon which all attempts to solve this very difficult problem must depend, have become recognised in their full significance. So long as the question was regarded as a purely chemical one, we can now see that little or no progress was to be expected from the efforts of the older school of chemists to remove the ignorance and doubt that have so long enveloped this great subject, because recent advances in scientific knowledge have shown that they had not at hand the necessary facts and methods of inquiry wherewith to probe to the heart the subject they were called upon to investigate.

It is to the comparatively new and rapidly growing science of bacteriology that the credit of indicating the lines along which investigators must proceed in order to solve this problem is due.

Bacteriologists have proved that agents for the purification of water, when it becomes fouled with such matters as sewage, abound practically everywhere in nature. These agents are minute living organisms, and their method of cleansing consists in changing, by their own life processes, the organic matters of which sewage is mainly composed into certain inorganic matters—viz., carbonic acid, ammonia, nitric acid, and water, which are not only harmless to animal life, but are of considerable importance and value to vegetable life. These minute organisms are quite distinct from the class of pathogenic or disease germs which we have so much reason to dread, and which I fear have brought into evil repute the whole world of micro-organisms.

All here are no doubt aware that there is a large class of organisms, the germs of which are widely distributed throughout nature—in the air, in water, and in the earth's crust. These organisms thrive on dead organic matters, and their normal effect on animal and vegetable life is, as we know by experience, solely a beneficent one. They are known as saprophytic organisms, and it is to them I refer as nature's agents for

cleansing water when it becomes fouled with organic matters such as sewage. I have said that the normal effect of saprophytic organisms in nature is a beneficent one. This statement must, however, be qualified by the reservation—only when their surrounding conditions are such as to promote their healthy life processes. Under unhealthy conditions they assume quite another aspect. They then give rise to certain other changes in the dead organic matters on which they thrive, and possibly they become changed in their own functions. In either case they become more or less a source of grave danger to health.

So far as regards the conditions necessary for the healthy life processes of these organisms, there practically is only one—it is that the organisms shall be supplied uninterruptedly and continuously throughout their whole life histories with oxygen.

I have made these prefatory remarks to emphasise the fact proved by recent advances in science, that nature is abundantly provided with the means of silently but surely changing refuse organic matters such as sewage into harmless forms of matter, in the form of minute organisms, but that these organisms can only effect such changes when the conditions for their healthy life processes exist.

We know by unpleasant experience that under all ordinary conditions sewage presents quite the reverse of favourable conditions for these organisms, and as a result we have the offensive odours so characteristic of it.

The question arises, is it possible to treat water-carried sewage in such a way as to ensure favourable conditions for the healthy life processes of the organisms? Undoubtedly I think it is.

Let me ask you to consider the simplest case of sewage pollution—viz., the discharge of a small bulk of sewage into comparatively very large volumes of running water, *e.g.*, the discharge of the sewage of a small village into a comparatively large river.

It is well known in such a case, even when the river is very sluggish, that all traces of sewage are soon lost sight of, and if anything can be detected by chemical analysis in the water in the lower reaches of the river, it is only the harmless forms of matter into which the sewage has been converted—viz., carbonic acid, water, ammonia, and nitric acid. How is it that in such a case the sewage does not give rise to unpleasant odours or other noticeable unpleasant effects? The explanation is simple. In the first place, all water exposed to the air absorbs a certain quantity of oxygen therefrom, and retains the oxygen dissolved within it. Every 1,000 volumes of good river water, according to the season of the year, contains six to eight volumes of oxygen dissolved in it. In the second place, the number of organisms which will be developed will practically directly depend upon the volume of sewage discharged into the river. In the case I am instancing the sewage will become diluted

enormously with good water before the organisms commence to multiply, and then in no part of the mixture will the organisms develop in numbers too large for the water to supply them with oxygen during their whole life-histories. I have found by experiment, for example, that the Vartry water in the summer season contains sufficient oxygen dissolved in it to maintain healthy conditions to micro-organisms, when it is mixed with ordinary sewage, from which the solid matters had been separated by subsidence, in the proportion of 1 volume of sewage to 50 or 100 volumes of water. I found, after keeping mixtures of 1 volume of sewage and 100 of Vartry water carefully excluded from air for some time, that all trace of sewage had completely disappeared in them, and the only indications left of its former presence were a little carbonic acid and nitric acid, two bodies, as I have already remarked, perfectly harmless to health and beneficial to vegetable life. A short explanation then of the fact that large volumes of river water may be contaminated with small volumes of sewage, and every trace of fresh sewage quickly lost therein, without any intermediate stage of unpleasant odours being set up therein, is that the river water possesses agencies and conditions necessary for self-cleansing. It is only when too much sewage is discharged into river water, and the micro-organisms in consequence become so numerous that they overtax the power of the water to supply them with atmospheric oxygen, that changes in the sewage matters injurious to health are brought about by the organisms.

I think I have said enough to show that these minute organisms in reality constitute the crux of the sewage problem. Under healthy conditions the sewage may be safely left to their unaided efforts; under most circumstances, however, they must be artificially aided. The consideration of how artificial aid may be given leads me at once to the process with which we are particularly concerned to-day, and I will now proceed to give a brief outline of it.

Nearly the whole of the matters in suspension in the crude sewage is first separated by simple mechanical subsidence; the sewage is then subjected to chemical oxidation and precipitation by treatment with one of the most powerful oxidising agents known to chemists—viz., manganate of soda. The organic matters in the sewage and the manganate quickly react upon one another, the greater portion of the former being decomposed into carbonic acid and other harmless bodies, and the brown insoluble peroxide of manganese, which is one of the products of decomposition of the latter, subsides to the bottom of the tank in which the operation is conducted, and carries down with it lighter particles of matter in suspension which escapes subsidence during the first part of the treatment. This peroxide is recovered and used for purposes I shall afterwards explain. The partially purified sewage is subjected to a further precipitation by treatment with sulphate or preferably chloride of alumi-

nium. After this treatment the purified liquid is clear, free from smell, and practically free from suspended matter; the organisms existing in the crude sewage are also largely if not entirely precipitated with the oxides of manganese and alumina; the latter oxide being one of the best agents known to bacteriologists for concentrating and separating micro-organisms from ordinary water. The purified liquid also contains but a very small fraction of the organic matters originally present in the crude sewage. The organic matters, which remain in the liquid, are of such a character that they can only be decomposed and converted into harmless forms of matter on a large scale through the agency of micro-organisms. It will be observed, then, that the object of the process up to this stage is to separate and decompose by precipitation and oxidation as much of the organic matters as possible, and to leave as little as possible for organisms to thrive upon. The subsequent treatment has in view the furnishing of proper conditions for the healthy life processes of colonies of fresh organisms, the germs of which are derived principally from surrounding objects and air, and which I have said can alone effect the decomposition of those organic matters which survive the first part of the treatment. This is effected by adding to the purified liquid small quantities of nitrate of soda, a substance which it has been found the organisms can decompose and from which they can abstract the oxygen necessary for their own healthy life-processes. After this treatment the purified sewage may be discharged into any ordinary outfall—*e.g.*, a river or stream, without any danger of putrefaction being afterwards set up in the waters thereof.

Let us now turn to the deposits of solid matters obtained in the working of the process. Three separate and distinct deposits are obtained:—(1.) the solid matters of the sewage itself; (2.) the peroxide of manganese; (3.) the oxide of alumina mixed with a little peroxide of manganese. It is now only necessary to consider the first mentioned. At the works of this Institution the solid sewage matters obtained from day to day are so small in bulk that no special treatment has been found necessary for them. A novel feature of the process, however, is the means which can be adopted, if it becomes necessary, to prevent organisms from setting up putrification in these solid matters. We have found that the organisms which thrive in these solid matters have the remarkable power of decomposing the recovered peroxide of manganese, above described, and absorbing oxygen therefrom, and that if the sewage solid matters be mixed with a sufficient quantity of this recovered peroxide, putrefaction is prevented in them, during the process of air-drying, the peroxide being partially deoxidised by the organisms and converted into carbonate of manganese.

Viewed from first principles, I think the process which I have outlined can fairly be said to satisfy them. The very valuable properties of manganate of soda are taken advantage of to the full, and we have thereby,

first, an oxidation of much the greater portion of the soluble organic constituents of the sewage, then a precipitating effect caused by the separation of the peroxide, and finally the means of supplying oxygen in the form of this peroxide to the organisms which develop and multiply in the solid sewage matters so long as they remain wet. In addition to this, enough nitrate of soda is added to the purified sewage to ensure a sufficient supply of oxygen to the organisms which continue to develop and multiply. After the organic matters have been completely decomposed, the organisms die down and the liquid becomes perfectly clear. I ought perhaps to add, in conclusion, that the observations I have made are based upon a special study of the subject which my friend, Mr. W. Kaye Parry, and I have for some five or six years past been engaged upon, both in the laboratory and at trial works especially erected for the purpose.

Mr. W. Kaye Parry, M.A., B.E., Univ. Dubl., said that the application of the forces of nature to the requirements of the human race falls to the lot of the engineer, but when he is called upon to put into harness the minute organisms whose functions have been investigated by the researches of chemists and bacteriologists, he is beset by many practical difficulties.

Something has just been said about the life-history of these organisms and the part which they may perform in the reduction of organic matter in sewage and other similar foul liquids, but just as Galvani's fundamental experiment was but the foundation of a science which has found its ultimate application in the numberless developments of electricity, so it is a far cry from the discovery of the friendly microbe to the time when we find him busily engaged in ministering to the wants of the human race.

In applying scientific principles to the problem of sewage purification great difficulties arise, principally on account of the varying character of the liquid with which we have to deal. "Sewage" is a very comprehensive term and is applicable to many liquids which differ greatly in composition. Not only does the character of the liquid vary in different towns according to the nature of the trades and manufactures, but even in the case of any given town the nature of the sewage changes from hour to hour. A sample, for example, collected at mid-day, if analysed is very different to a sample collected at mid-night. So also in the case of an institution, we are called upon to treat a liquid which both in quantity and in chemical composition is constantly changing. At one time the quantity delivered per minute at the works may be ten times as great as another, and perhaps much more foul or much more dilute.

During certain hours of the day the liquid will contain an excess of grease, at another time we may receive a very large proportion of soap. During heavy rains the volume will not only be enormously increased,

but, under certain conditions, may be accompanied by a great quantity of suspended matter. The temperature also undergoes considerable variation, and as chemical changes and bacterial development are both influenced by temperature, these changes are not without effect in the works. Again, the liquid may be acid, neutral or alkaline, and these different states effect the treatment as every chemist can testify.

If the problem of sewage purification consisted in treating a liquid which was uniform in quality, in volume and in temperature, it would not only be possible but comparatively easy in judiciously designed purification works, by the application of the principles set forth by Mr. Adeney, to produce an effluent which would differ but little from an average sample of drinking water. But to secure an ideal effluent under the conditions which obtain in practice is not so easy, for we must so arrange our works that skilled attendance can be dispensed with, and the mechanism employed must be of the simplest character and capable of automatic regulation, so that the process can be left to itself and that a visit once a day by an ordinary labouring man will suffice to keep it in good order.

I will now explain what means we have adopted in order to endeavour to secure the best results.

The sewage from this Institution as it enters the works flows over a water wheel which it keeps in motion, and passes into a deep tank sunk in the ground. It is conducted through a timber trunk to the bottom of the tank, and before it can escape it must rise again to the surface. The heavier suspended particles fall to the bottom, while the gelatinous matter forms a kind of filter which entangles and retains a large percentage of the finer particles, so that from eighty to ninety per cent. of the matter in suspension in the sewage is intercepted in this tank by a purely mechanical process. The clarified liquid then flows under the floor of the tank to a mixing race, the object of which will be described hereafter; the liquid passes on into tank No. 2, which is similar in construction to No. 1, it is conducted to the bottom as before and then rises to the surface. It then passes out into tank No. 3, through which it is carried in a similar fashion, and finally it flows out of the works and runs away through an open ditch.

We will now return to tank No. 1, in order to see how the chemical reagents are added. I have said that the sewage as it enters the works causes a small water-wheel to rotate, and the velocity of rotation is obviously proportionate to the volume of the sewage. Each revolution of this wheel actuates a valve placed at the bottom of a hopper containing dry manganate of soda, a small quantity of the chemical is released by each revolution, the manganate falls into a little stream of water, and the chemical solution is conducted into the clarified sewage on its way to the mixing-race. The object of the latter is to mix the solution

with the sewage, and after this the treated liquid passes into tank No. 2. The manganate of soda is decomposed, and the brown oxide of manganese is collected in the tank owing to its special form. As the liquid passes into tank No. 3 a solution of sulphate of alumina is added, and the quantity is regulated by an automatic feed, which is also actuated by the wheel already described, and is therefore always in proportion to the volume to be treated.

This alumina is recovered in tank No. 3, and before the effluent leaves the works it received its "dose" of nitrate of soda, the quantity of which is also regulated by the same machinery.

If you have followed this brief description you will observe that the power required for actuating the regulating machinery is obtained from the sewage itself, and that the quantities of all the three chemicals which are added are always directly proportionate to the volume of sewage to be treated.

As regards the matters collected in the three tanks—namely, the crude sewage sludge in No. 1, the oxide of manganese in No. 2, and the alumina in No. 3—they are all withdrawn from the tanks daily in a very simple way. A sludge pipe is fixed in the centre of the timber shoot of each tank, which passes down into a sump. These sludge pipes are connected with wrought-iron closed cylinders, which are fixed on suitable stands. The air is partially exhausted from each of these cylinders by a mechanical contrivance which takes the place of an ordinary air-pump. The stop-cocks on the sludge pipes are then opened and the several deposits pass up into the cylinders.

Beneath each cylinder is a sludge-cock, from which is suspended a canvas sack. When the cylinders are filled the sludge-cocks are opened and the deposits fall into the sacks. The liquids gradually drain away, and are conducted back into the tanks from which the deposits were removed.

When the liquids have drained away the sacks are lifted off.

The sludge from tank No. 1 can be used as a manure, as it contains a considerable amount of ammonia: and the oxide of manganese can, if desired, be used as a deodorising agent, as explained by my colleague.

The man in charge has only to fill the hopper and the two chemical tanks every day and to remove the sludge, an operation which is very rapidly performed.

The machinery for regulating the supply of chemicals has been designed by Mr. James Carson, C.E.

To prevent misapprehension I may state, in conclusion, that, as the pail system is in operation at the Asylum, we do not receive all the sewage of the institution; but you must not infer from this that our difficulties are therefore lessened, and that we are dealing merely with a weak sewage, for the very reverse is the case.

We have on several occasions had samples collected hourly for an entire day, and a portion of the mixed sample analysed, and we find that the sewage is abnormally foul. To enable you to form an opinion on this point, I have put down on the diagram the quantities of free ammonia, albuminoid ammonia, and chlorine contained in the Dundrum sewage, and also the corresponding figures for some other places according to the analysis published by Henry Robinson in his work on sewage disposal. The dry-weather flow with which we are dealing amounts to about 6,000 gallons per day.

ARMY MEDICAL STAFF.

The following is the official list of successful candidates for Commissions in the Medical Staff of Her Majesty's Army at the Examination held in London in August, 1893:—

Order of Merit	Names	Marks	Order of Merit	Names	Marks
1.	Master, A. E.,	2,421	7.	Clark, E. S.,	2,043
2.	Prynne, H. V.,	2,373	8.	Boyle, M.,	2,036
3.	Dansey Browning, G.,	2,271	9.	Fox, A. C.,	2,012
4.	Barnett, K. B.,	2,117	10.	Tibbits, W.,	2,009
5.	Fleury, C. M.,	2,090	11.	Corbett, W. J.,	1,986
6.	Cameron, K. M.	2,050	12.	Green, S. F. St. D.	1,978

"THE PROVINCIAL MEDICAL JOURNAL."

THE July number of this monthly (edited by Dr. T. M. Dolan, and published at Leicester), devotes an editorial to infant mortality in Egypt, comparing it with English rates, which are quite sufficiently appalling. In 101 English towns there are 151 deaths of children under one year of age per 1,000 births; in London, 154; in Staffordshire, 171. In Egypt, in 31 towns, with an aggregate population of 1,002,961, the corresponding rate for 1892 was 263; in 1888, it was 264; in 1889, 293. In the three years 49 per cent. of the children born in these towns died before completing their fifth year. It is admitted that the birth and death rates are not absolutely correct, being based upon the census of 1882; but the numbers of births and deaths are probably accurate. Dr. Pearse's paper—"Illustrations of Desires for Change of Diet in Natives of India and Europeans"—contains a great deal of curious information, as well as many useful hints for dietary treatment. The craving for *onions* in phthisical and "præ-phthisical" patients, of which many instances are given, is very remarkable. Amongst the *Miscellanea* we find the following:—"The total number of women at present studying medicine in the French schools is 229; 122 French, ninety-five Russian, four Roumanian, two English, two Servian, two Bulgarian, one Turkish, one German."

INTRODUCTORY ADDRESS.[a]

By James Craig, M.D., Univ. Dub., F.R.C.P.I.; Physician to the Meath Hospital and County Dublin Infirmary.

Gentlemen,—In accordance with old traditions in this hospital, it is the custom for one of the members of the Medical Board to deliver an inaugural address to the students at the commencement of each Winter Session. This practice, which a few years ago was largely prevalent in London and Dublin, is now showing signs of decay, and already one finds that the teaching staff in not a few of the leading hospitals have abandoned the usage altogether, giving for their reason that the labour involved in writing a suitable address is out of all proportion to the benefit which is derived by the students from its delivery. But the growing dislike to the practice has arisen rather from the unfortunate principle of the rotatory system, by which every teacher in turn becomes the mentor. A man may be a most astute physician, or a bold and skilful surgeon, and still lack the lecturer's art. To few, indeed, is entrusted the rare gift of knowing what are the right things to say on these occasions, and also of saying them with impressiveness and eloquence. When such men are found, whose experience is ripe, whose lives are noble examples, and whose tongues are tipped with fire, to them should be entrusted the duty of arming the youthful knights who are about to join the ranks of those who do battle with disease and death. However, even in the absence of men thus gifted, I am sure we are right in still adhering to the custom of welcoming our students by an annual address, and in setting apart the opening day of the Session to instruct them, not in the theory and practice of medicine and surgery, but by a helpful lesson as to their future work and conduct. And although the law of rotation is the chief plea for my temerity in being the spokesman to-day, I shall endeavour, if you will kindly bear with me, briefly to offer a few hints on matters relating to your student life, for I have passed along the same highway which you are now about to tread; I have "scorned delights and lived laborious days;" I have watched the light in my lamp of hope sink to a feeble flicker; I have tasted the sweets of partial success; I have thrown aside my books, appalled alike with the unending work and the deceit of memory; and I have "gone with the tide in my youthful pride, like a ship without a sail."

But, before I venture to offer you my feeble counsel, will you allow me to speak of certain changes we have to record which should not be passed over. Since our last inaugural address was delivered, the hospital has

[a] Delivered at the opening of the Session of 1893-4, in the Theatre of the Meath Hospital, on Monday, October 2, 1893.

lost the services of a great physician. When Dr. Foot discovered that the physical strain of clinical work was more than he could undertake, the news of his resignation was received with infinite regret, not only by his colleagues here, and by every old pupil whom he had taught within these walls, but also by the entire medical profession in Dublin. If the Meath Hospital has obtained a world-wide renown through the clinical teaching of Graves and Stokes, the fame of the institution which he loves so well has not suffered at the hands of Arthur Wynne Foot; for, as a truthful bedside observer, and a foremost clinical teacher, his name is not unworthy to take rank with these masters as the last of an illustrious trio. At times like these his absence will be sorely felt, for during his twenty-one years of office he delivered the inaugural address no less than seven times, and on each occasion the Theatre was filled with a charmed and spell-bound audience. The students who were privileged to listen to these addresses could never complain of their dulness or want of use. Many a one has heard with pent-up emotion his earnest appeals for devotion to work, and has been filled with fresh resolves to struggle after the high ideals of conduct and action laid down by one whose practice differed not from his preaching. And you will scarcely blame me if I have become so permeated with the truth of his noble teaching, that to-day I will but echo in part the sentiments of one who was to me "scarce other than my own ideal knight." And, indeed, as the successor of Dr. Foot in this hospital, I have no higher ambition than to follow humbly along his industrious path. But the tones of regret in which I have spoken of our loss should be changed to notes of gladness, for we all rejoice to think that one whose true and honest labour has added much to the science of medicine has still many years of quiet but active work before him.

The hospital has further to deplore the loss of Professor Rawdon Macnamara, whose death, in April last, after a few days illness, came like a sudden blow on those who knew him. His funeral, which was conducted with all academic honours from the portals of the College of Surgeons, was attended by such a vast body of his professional brethren and friends, as to be ample evidence in itself of the high esteem in which he was held. For thirty-two years he was connected with this hospital, and, in the words of the *Lancet*, "he was a most conservative surgeon, though a fearless and quick operator, and in the wards was a great favourite with the students. Gifted with an excellent memory, he was, perhaps, one of the most happy retailers of anecdote of his time, and always seemed able to 'cap a good story with a better.' It is no disparagement to even such a profession as is the medical to say, few men in it were so highly educated as was Professor Macnamara. He was a rare linguist, speaking classic Latin, French and Italian, with ease, fluency, and correctness. For a humanity that invoked sympathy with all sorts and conditions of men,

and a rare culture of mind that made him at home among the brightest and most accomplished men of all nations, that secured for him the Honorary Degree of the University of Dublin, the Honorary Membership of the Apothecaries' Hall in Ireland, and the Fellowship of the Medical Society of the University of Christiania, we shall ever regard him alike with affection and admiration."

The vacancy caused by Professor Macnamara's death was filled by the election of one who deserved well of this hospital—one who had already worked in its interests for six years, and whose distinction has been recognised as soon by the public as by the members of his own profession. I allude to my friend Dr. Lennon, whose modesty is only equalled by his ability, and both would be outraged by praise. He is now the Honorary Secretary to the Medical Board, and if you will apply to him in any difficulty you will find him to be a guide, philosopher and friend.

It is only right to tell you that, in filling this surgical appointment by the selection of one who had already won high rank as a physician, the interests of the Meath Hospital were not forgotten.

A spirit of reformation where improvements were needed has ever characterised its management, and so well have our governors done their duty that a few days ago a member of the Corporation described its condition as being "more like a palace than an hospital." Nothing has ever been left undone that could add to the comfort of the sick or the efficiency of the institution, and the latest evidence of this was a thorough overhauling of the drainage system which has just now been completed.

But, if we aim at perfection, it seems to me, and to others as well, that the time is ripe for a further advance—that a change should be made in the direction of a more equal distribution of the medical and surgical staff. Two physicians and six surgeons, it is true, have always manned the hospital; but that is scarcely a sufficient reason to refrain from making an alteration. The additions made to the hospital from time to time have increased both the medical and surgical work; but this would naturally be felt more where the duties are divided between two than where they are distributed among six. Besides, if medicine and surgery are taught on alternate days during a nine months' Session, an easy calculation will show you that the work of instruction is apportioned so unfairly among the staff, that the surgeons off duty begin actually to pine for the class. Again, it has been felt that our accommodation for the treatment and practical teaching of fevers is still inadequate, and that a strong effort should be made to enlarge our present fever buildings. If this were done—and we hope it soon may be done—the number of patients requiring medical treatment would almost be equal to those demanding surgical aid.

For these reasons we hoped that, if the medical staff could be increased at the expense of one from the surgical side, matters might be more fairly

adjusted, and Dr. Lennon might then breathe the purer air of a higher atmosphere with advantage to patients and pupils alike.

It is now my privilege, on behalf of my colleagues and myself, to offer a hearty welcome both to the recruits who come amongst us for the first time this Session, and to those who have been with us in the past. We like to see the old familiar faces once more, but the fresh young ones interest us greatly. Our work as physicians and surgeons to a large hospital is a very responsible one; we have to do our best for the patients, and at the same time look well after the training of our students—and it is with the beginner that the greatest care is required; for, as in the breaking of a colt, if, in the early days of training, he gets frightened, and is not reassured, or if he is allowed to have his own way without proper restraint, vicious habits are contracted which can never be corrected, and which will damage his usefulness for ever after, so in the career of the student of medicine it is very easy for him as a novice to glide into habits of carelessness and get on the wrong lines, which never will bring him to the goal of success. Therefore it is that the teacher's care over the beginner is of such importance.

The choice of medicine as a profession should not be made lightly. I am convinced that in no other calling in life are such demands made on the patience, courage, strength, and sensibilities of the starter as in our own. It is, perhaps, the very noblest profession, but it is also the very hardest. To the beginner, then, I would say, keep up a brave heart, and remember that on the long up-hill road to success the steepest rise is at the start. Do not get disheartened with weary days in the dissecting-room, when the organs of special sense are in revolt, and anatomical names and relations have left the brain in a hopeless muddle. Do not get frightened lest you should never be able to stand the sight of blood. You can do what many have done before you, and time and patience will conquer most dislikes. The late Sir Philip Crampton, "who was for sixty years a surgeon to this hospital, and whose name still stands without a rival in the aristocracy of Irish surgery," was accustomed to cheer the despondent student by the remark that even in his fourth Session the sight of a serious operation had caused him to collapse.

I have already said that the choice of medicine as a profession should not be made lightly. The possession of good health is a qualification of countless value. The calls that are made on the strength of the student should make the weak or delicate pause before entering the lists. In any case I charge you look well after your own health—prevention requires no cure. There is no excuse for getting ill by moping indoors, and no matter how hard your work may be, the taking of exercise is a matter of duty. Nearly all of you are fond of athletics in some form; follow up your particular liking, and stick to it all the more the harder you have to work. If you play football so much the better—it is a winter's game,

and takes up little of your time, and a broken collar bone or a sprained ankle are better companions than indigestion or consumption; besides, there is a much-coveted hospital cup that has adorned our Hall for many years, and some of you may win renown by helping to replace it on its present vacant stand. If you fear the rough usage of the football field, you can join a club of harriers and gain fresh vigour by a weekly run in country air over meadows and ditches. There is plenty of choice—tennis, cycling, rowing, golf, and cricket—enough to suit the most fastidious, and to render it a marvel that advice like this is necessary, but in my short experience I could startle you with the number of classmates, and students since then, I have seen carried off by diseases which could be directly traced to a reckless disregard of the laws of health, or indirectly to a weakened physical condition brought on by want of exercise. It is therefore not idle for me to counsel you to look well after your health, for the seedlings of weakness which are planted in your student days may remain as perennial roots to destroy the full harvest of your after life. The healer of the sick should himself be well. The best medicine in your list of remedies will often be your own bright, cheerful, and hopeful countenance, and it is hard to assume this if the thorn of physical weakness is acting as a constant irritant.

And now let me turn from the subject of play to that of work. You are coming to your studies armed with youth and hope and enthusiasm, and splendid fighting gear they are; but youth is fond of pleasure, and hope may be the seductive whisper which promises that idle days and neglected studies can be made good by future effort, and enthusiasm too may spread itself over much less important objects than daily work. So you see that, in addition to youth and hope and enthusiasm, you will require a more extensive equipment to carry you over the thorny paths of first beginnings, and I cannot do better than here quote to you the advice of Dr. Foot. He says:—

"The youngest here can understand the meaning of the words Earnestness, Industry, Perseverance. Take any one of them and make it mentally your watchword, and it will prove an amulet, or talisman, against idleness, waste of time, slothfulness, and all the snares and toils which beset a student, and, perhaps, especially so a student of medicine. The man who begins the study of medicine with a fixed resolve to work earnestly, industriously, and perseveringly, is more sure of ultimate success than if, unsupported by these principles, he were backed by wealth, rank, and influence. These latter auxiliaries can make a man in a sort of a way, but he is not a real man, and is likely to collapse should any of these props be withdrawn. The principles of earnestness, industry, and perseverance make a real man, the best kind of man—a self-made man, a Napoleon among his fellows, one who will be reliable in danger, fertile in

resource, cool in difficulty, decisive in action, furnished at every turn with the precise weapon he needs."

There is a whole sermon for your reflection put into a few sentences, and from it you cannot fail to gather the attitude and spirit with which you must approach your work.

The subjects set apart for your earlier studies must be thoroughly mastered, and it is only by so doing that you will be able to lay deep and firm the scientific groundwork for the study of the disorders in the structure and functions of the body, which is to be your ultimate special work. Coming to the Medical School with a fair knowledge of Mathematics, you will proceed to Physics and Chemistry, and then pass on to Physiology. And so from Elementary Anatomy you will pass on to that which is more advanced, including Histology, and then on to Pathology; in this way you follow the order of nature, beginning with the less and rising to the more complex sciences, using the lower as a ladder to mount up to the higher. And the further you advance the easier becomes the ascent, but only if each ladder you climb by is strong in its completeness.

Let me implore you, then, not to consider the junior subjects unworthy of anything short of absolute mastery. When you approach Anatomy, which treats of the structure, and Physiology, which treats of the functions, of the body, you have come to the real groundwork of your success in understanding the relations of health and disease. And I must tell you that in proportion as your knowledge of these twin subjects is acquired in the dissecting-room and the laboratory, so will they be of practical use to your after work. Difficult and tedious subjects they both are, but thoroughly they must be learned. It is always a source of grief to me to see a student content to pass with only a disconnected smattering of these radical studies; better far to become qualified in ignorance of signs and symptoms of unusual diseases than to go out into the world and attempt to draw deductions from insufficient premises. You are expected to devote a fair share of your time during three winters to the study of Anatomy, and this is not too much, considering its magnitude and importance, and the constant repetition which it demands; but rather unwisely on the part of the Royal Colleges, their students will be examined on the entire subject at the close of their second year, so that the amount of knowledge derived from the last winter spent in the dissecting-room will be left for their conscience alone to gauge.

If this be an error, a greater one still exists in the case of the sister subject. Trinity College has wisely decided on a two years' course of physiology, while the Royal Colleges are content with one. This is greatly to be regretted, for no Professor in the time at his disposal can possibly cover with his lectures more than one half of the subject. It is right that he should begin with the elementary and easy parts, and accordingly the

more advanced, in which help is needed the most, are left untouched. The student may try his best, but it is a weary task to cull from books alone the facts that are worth remembering. But apart from the fact that the student is left to make up, as best he may, the dry experiments which are often plain enough when seen, I consider that one session is quite insufficient in which to get a complete and useful survey of the hardest subject in the whole curriculum. The result of this one course system is evident in the examinations. The student on whom fate smiles is questioned on the easier matters on which he has also been lectured, and so passes, but he on whom the goddess frowns quickly receives his rejection, and must await his day of luck.

However, you must only endeavour to do your best with the course that is put before you, as a mistake like this can only be altered through time; and besides, unlike anatomy, physiology is a subject which grows so rapidly that any one who strives to keep at all abreast of the times must never cease to read. And if you are not satisfied to remain at the dead level of mediocrity, even though you have failed in your student days to master the abstruse parts of the science, if your knowledge of anatomy be thorough you can pursue with deep interest and profit an after study of the subject. I cannot promise you though, that when you have the many anxieties of practice to distract you, you will feel inclined to go back to studies like these. And here too in Ireland our qualified men suffer from a disadvantage which does not obtain in England. There are no regular post-graduate courses in Dublin, where busy men labouring in the provinces can receive an occasional brushing up. There are few occupations more laborious than that of a hard-worked country doctor, and no matter how much he may wish to increase his information as medical knowledge itself increases his surroundings forbids it; and, therefore, it seems a pity, when many would gladly leave a substitute behind to perform their duties, in order that a month might be spent in the metropolitan schools, that such an opportunity should be wanting.

With regard to the extended period of study which came into force in 1892, the additions which have been made are chiefly in three directions. I do not intend to refer to the vexed question of how you are to spend the extra time at practical work in your fifth year, which will probably have to be settled by your purse. But a course in practical pathology now takes its place as a separate subject. True that in Trinity College such a course had been generously given for a number of years, but it was entirely optional. Now, however, the examinations in this subject, which were formerly of a vaguely theoretical nature, are likely soon to become as practical as is the case in histology. That this is a step in the right direction is very evident, for if we turn our attention alone to the examinations at present held for medical officers in the army and navy what do we find? A microscope is placed on nearly every table, and

besides requiring an intimate knowledge of the specimens placed under these, the various examiners in medicine and surgery give special prominence in every case to the minute pathology of each disease. In fact, pathology is now the subject of greatest importance in all the higher examinations.

Coming to the next advance which is aimed at in the new curriculum, you will find that the subject of Public Health, although nominally included in the former courses, will now occupy a more dignified position in your examinations. This change is one which is highly commendable, and should bear good results. We are living in the days of Preventive Medicine, and so much has already been done in enabling us to cope with the spread of fevers and other infectious diseases by observing the simplest hygienic rules, that a great deal more is to be hoped for in the future, and indeed any marked advance could scarcely have been expected, in view of the fact that so many of our graduates and licentiates received qualifications which covered the merest unpractical smattering of hygienic knowledge. What I wish to emphasise, therefore, is not that this subject has been introduced for the first time, but that more attention will now be directed to the teaching of it, and a fuller acquaintance with it expected at the examinations.

It is necessary, however, to mention in this connection, that a separate Diploma in State Medicine or Public Health has been granted for some years past by Dublin University and by the Royal Colleges, but this in reality has covered little ground. In 1871 Dublin University held their first examination, two of the four candidates on whom the Diploma was conferred being Dr. Foot and Dr. J. W. Moore, but the total number of diplomates since then amount in all but to 56. In 1883 the Royal College of Physicians initiated a like examination, which has been passed by only 26, while the Royal College of Surgeons, making a start in 1888, have now a total of 34 on their roll. At the present time a diploma in this subject, open to graduates and licentiates of a year's standing, can be obtained after passing the necessary examinations from Dublin University, the Royal University, and the Conjoint Board of the Royal Colleges of Physicians and Surgeons.

One might ask, at whose door is to be laid the blame that so few practitioners have thought it desirable or necessary to complete their education in this direction? Chiefly, I should say, at that of the Local Government Board of Ireland, who have all along been content to have medical officers of health appointed without any evidence of special knowledge to entitle them to undertake such posts. In England, on the other hand, the health officers are selected only from those who have taken out a Diploma in Public Health. To those of you, therefore, who in the future may be seeking for appointments in England, and equally so to those who may enter the naval and military medical services, the pos-

session of this qualification will be of great advantage, and, indeed, I hope the time is not far distant when this diploma will take its place on the list of compulsory qualifications.

The third addition which has been made to your studies is likewise one of importance. You are required to produce a certificate for three months' attendance at a hospital for the treatment of mental disease. In bygone days, your examiner might venture at times to set a question or two on the different forms of madness, but to miss or answer these was a matter of like importance. Accordingly, when it came to the turn of the general practitioner to sign a certificate for the removal of a lunatic he found himself greatly exercised in his mind as to what particular form of mental disease he should enter over his signature, and his prescriptions too when it came to a question of treatment were confined to a straight-jacket or a rope. However, that such a state of affairs might continue no longer, the law-makers of your medical education have wisely decreed that in *your* case a systematic clinical course must be taken out in one of the asylums for the insane.

I have endeavoured, in what has already been said, to point out to you the more important studies, which will form your groundwork in mastering the arts of Medicine and Surgery. These subjects are chiefly learned in the College schools, but the art can only be acquired in hospital, and the stress of my remarks to-day should have been mainly directed in impressing you with the truth of the latter.

You are coming here to study disease, or in other words, to learn the art of healing, and it is only in such a place as this, where each and every form of illness and injury are met with, that you can become familiar with the ways of the sick, and attain to such skill in the recognition and management of disease as will fit you for the practice of the Profession of Medicine.

You have here then ample material from which to acquire this knowledge, and as far as your teachers are concerned, I think I may safely promise that there will be no lack of effort on their part to give you the necessary help, so that with yourselves alone will rest the question of your future fitness or failure.

May I tell you by what methods you will ensure some proficiency in your hospital studies? To begin with, remember the quotation which I gave you from Dr. Foot, and then I would ask you to observe habits of strict regularity in attendance, and be among the first arrivals in the morning. Get close to the bedside, and begin at once to use your hands and eyes and ears. Note carefully what is pointed out to you, observing the way your teacher proceeds to obtain the needed information from the patient, and then the methods he adopts in making an examination of the case. You will soon arrive at a stage when a patient who is suffering from a simple ailment will be placed under your own personal charge.

Do not hesitate to ask for one if such a case has not been offered to you, nor refuse to undertake the duty when the offer is made. Lay aside the fear that your ignorance will be ridiculed by the class, or your inexperience discovered by the patient. At first, no doubt, you will feel timid and awkward in your dealings with the sick, and probably shy about reading your notes in the presence of the class, but these, like the shiver of discomfort that the swimmer feels before he takes his morning plunge, are to be met with prompt and decisive action.

This system of case-taking affords the best opportunity for a teacher to do his duty by the pupils. The principle of teaching by action was established in this Hospital by the first of the three great clinical masters whom I have already mentioned, and to prove that his most illustrious colleague, Stokes, was inspired by the value of Graves's system, I have only to quote from one of his lectures. He says—"One word as to the duty of teachers. It is not to convey all the facts of a subject to their hearers, but it is by precept and example to teach them how to teach and guide themselves. If they succeed in this they have done their duty in the largest sense of the word." In insisting, therefore, on your taking up at once the personal charge of clinical cases as the surest road to success, I am not expressing alone my own individual opinion, but I am supported as well by the written authority of those who themselves were kings in the domain of medicine, and also by my own teachers, who for their part never ceased to proclaim its truth by earnest example.

I have met with people who stood on the brink of a frozen pond, and gazed with admiration at the graceful movements of an accomplished skater until the conviction that the art of skating is very simple was only dispelled by a disastrous attempt to imitate them. And I find a parallel to this in the case of the outstanding students in a hospital class who look at the ease with which a skilful teacher uses his hard-earned knowledge in the diagnosis and treatment of disease, and refuse to believe that proficiency in any form is only the result of protracted effort.

Our aim, then, in clinical instruction is to meet you half way. Your part is to be performed by seeing with your own eyes, and gaining with your own hands and ears, as much information as your yet limited talent will allow. While on the other hand, we will endeavour to point out to you the additional facts where your observation has been defective or insufficient. You will quickly find that the subjects you are learning in the schools will be the footlights by which you can have a clear view of the great drama which treats of the recognition and relief of human suffering. And even after you have tried your best in the wards as a mere external pupil, there will still be so much for you to learn that unless you supplement it by coming to reside in the Hospital, or undertaking the duties of Clinical Clerk, you will never know what golden

opportunities you have missed. Inquire from a few who have been fortunate enough to occupy these positions, and you will find their experience and advice will coincide with mine. They will tell you that in this way real interest in their work sprang up to noble proportions, that a self-reliance in face of the worst accidents crept over them, and that their minds became quick in suggesting a proper line of treatment.

In this connection also I would ask you to frequent the out-patient department, where the more trivial ailments are seen. It is these that are oftenest met with in after-life, and you will do well to learn their treatment, and also to familiarise yourselves with the difference between the examination of a patient at the bedside and in the study.

I shall not detain you much longer. You will pardon me if it seems egotistical for one of my years to speak of what your conduct should be. I stand on no lofty platform of superior virtue; but from my place in the student ranks I have seen the qualities that in our chiefs have won all hearts, from that of the sick beggar to the critical leader of society, and, hardest of all to win, that of the members of their own profession. I dare scarcely, then, do less than tell you what to me has seemed most worthy of aim. The character which is formed in your student days will not readily leave you. Strive, then, to keep fresh and green the innocence in which most of you have left the pure atmosphere of home. The antidote to the many temptations which surround you will be found in work, in healthful recreation, and in the charm that some outside hobby will yield you. Idleness is the vice which will lead you into many traps, work is the potion with which you will drug the monster of temptation and win your Golden Fleece. A special hobby for your spare time and tired moments will be to you, as it has been to all men, a haven of rest in which to repair your energies. If you have a taste for art or literature, or mechanics, so long as they do not become the master passion, their indulgence will be to the mind what food and sleep are to the body.

Courage in the face of danger, and a spirit of the highest self-sacrifice are traits so common among our body that their mention here is superfluous. Only the other day we read of a professional brother that "in the memory of Thomas Heazle Parke all Irishmen possess an ideal of what a man should be."

You require to be sympathetic, and if you are not possessed of this quality in a very large degree you must foster carefully what of sympathy you have, and cherish its growth with incessant watchfulness. You have mistaken your calling altogether if you ever become callous or hardened in the presence of suffering.

Your sympathy will show itself best if you are gentle, tender, and kind to your patients—to the poor no less than to those who live in affluence. I know not in what way to express with sufficient force my contempt for the man who has a smiling face for the rich and a biting tongue for the

poor. Never give pain with finger, tongue or manner if you can avoid it. You must, of necessity, at times give pain with your hands, but never let it be done thoughtlessly. Forewarn the sufferer, and then do your part without hesitation. Take up a position of manly independence from which arrogance should be entirely absent. Be no man's creature, if you would preserve the self-respect which alone can win the respect of others. Scorn to trade by methods of humbug on the credulity of human nature. Use no unworthy means in your efforts to succeed, for, though temporary success may follow, you will fail to gain the confidence of those whose opinions you most highly value. Acquire a name for truthfulness—it may do little to increase your banking account, but it is of greater value to the possessor than gold. Aim at that goodness of heart which can appreciate the good qualities, and still make allowances for the shortcomings, of others.

And to those who are about soon to leave this friendly harbour, where they have taken in supplies with which to embark on the voyage of life's work, I would give the additional advice—Endeavour to avoid our besetting sin, which is professional jealousy and backbiting. And I would add to this the words of Whittier—

> "The paths of pain are thine. Go forth
> With patience, trust, and hope;
> The sufferings of a sin-sick earth
> Shall give thee ample scope.
> Beside the unveiled mysteries
> Of life and death go stand,
> With guarded lip and reverent eyes,
> And pure of heart and hand."

ACTION OF MICROBES ON PLANTS.

We learn from the *Gazette Médicale de Paris* that M. Charrin communicated recently to the Académie des Sciences the first results of his investigations of the action of microbes upon plant tissues. Having inoculated the *Bacillus pyocyaneus* into the fleshy leaves of a crassulaceous plant, he found that the mode of action of the microbe is the same in the vegetable as in the animal kingdom. In both there is, first, the effect of the traumatic injury, followed by that of the secreted toxins, and the struggle between these and the anatomical elements with which they are surrounded. The differences between the two cases relate to the means of defence against the pathogenic agent. Chemical defensive action is very much the same in both kingdoms; but in plants mechanical means are more strongly marked and more potent, while in animals the protective action of phagocytes is far superior.

SANITARY AND METEOROLOGICAL NOTES.

Compiled by J. W. Moore, B.A., M.D., Univ. Dubl.; F.R.C.P.I.; F. R. Met. Soc.; Diplomate in State Medicine and ex-Sch. Trin. Coll. Dubl.

Vital Statistics

For four Weeks ending Saturday, September 9, 1893.

The deaths registered in each of the four weeks in the sixteen principal Town Districts of Ireland, alphabetically arranged, corresponded to the following annual rates per 1,000 :—

Towns	Weeks ending				Towns	Weeks ending			
	Aug. 19	Aug. 26	Sept. 2	Sept. 9		Aug. 19	Aug. 26	Sept. 2	Sept. 9
Armagh -	21·0	21·0	7·0	7·0	Limerick -	11·2	21·1	14·0	29·5
Belfast -	22·0	25·8	27·1	22·0	Lisburn -	17·0	12·8	34·1	12·8
Cork -	20·8	16·6	18·0	22·8	Londonderry	34·6	18·8	20·4	14·1
Drogheda	17·6	17·6	8·8	17·6	Lurgan -	27·4	13·7	13·7	4·6
Dublin -	26·1	21·5	27·4	21·5	Newry -	16·1	20·1	20·1	4·0
Dundalk -	29·3	12·6	16·8	4·2	Sligo -	0·0	20·3	25·4	0·0
Galway -	30·2	37·8	30·2	3·8	Waterford -	27·5	32·5	30·0	25·0
Kilkenny	33·0	28·3	51·9	14·2	Wexford -	40·6	4·5	22·6	31·6

In the week ending Saturday, August 19, 1893, the mortality in thirty-three large English towns, including London (in which the rate was 22·5), was equal to an average annual death-rate of 22·8 per 1,000 persons living. The average rate for eight principal towns of Scotland was 18·5 per 1,000. In Glasgow the rate was 17·0, and in Edinburgh it was 15·5.

The average annual death-rate represented by the deaths registered during the week in the sixteen principal town districts of Ireland was 23·8 per 1,000 of the population, according to the Census of 1891.

The deaths from the principal zymotic diseases in the sixteen districts were equal to an annual rate of 5·3 per 1,000, the rates varying from 0·0 in Limerick, Galway, Drogheda, Wexford, and Sligo to 14·2 in Kil-

kenny—the 7 deaths from all causes registered in the last-named district comprising 2 from measles and 1 from diarrhœa. Among the 112 deaths from all causes registered in Belfast were 4 from measles, 1 from scarlatina, 1 from typhus, 3 from whooping-cough, 2 from diphtheria, 4 from enteric fever, and 27 from diarrhœa. Of the 22 deaths in Londonderry 1 was from whooping-cough, 1 from diphtheria, and 1 from diarrhœa. The 11 deaths in Waterford comprised 1 from measles and 1 from typhus. The 4 deaths in Lisburn comprised 3 from diarrhœa. The Registrars of Belfast No. 9 District and of Lisburn make reference to the prevalence of English cholera in their respective districts.

In the Dublin Registration District the registered births amounted to 208—108 boys and 100 girls; and the registered deaths to 179—85 males and 94 females.

The deaths, which are 19 over the average number for the corresponding week of the last ten years, represent an annual rate of mortality of 26·7 in every 1,000 of the population. Omitting the deaths (numbering 4) of persons admitted into public institutions from localities outside the district, the rate was 26·1 per 1,000. During the first thirty-three weeks of the current year the death-rate averaged 27·2, and was 1·4 under the mean rate in the corresponding period of the ten years 1883–1892.

The number of deaths from zymotic diseases registered was 38, being 14 under the number for the preceding week, but 9 over the average for the 33rd week of the last ten years. The 38 deaths comprise 2 from measles, 1 from typhus, 7 from whooping-cough, 9 from enteric fever, 12 from diarrhœa (being 18 under the number from that cause in the preceding week, and 2 below the average for the 33rd week of the last ten years), and 1 from erysipelas.

The number of cases of enteric fever admitted to hospital was 22, being an increase of 3 as compared with the admissions for the preceding week, but 1 under the number for the week ended August 5. Twelve enteric fever patients were discharged, 2 died, and 81 remained under treatment on Saturday, being 8 over the number in hospital at the close of the preceding week.

Seven cases of scarlatina were admitted to hospital, against 9 for the preceding week: 9 patients were discharged, and 49 remained under treatment on Saturday, being 2 under the number in hospital on Saturday, August 12.

Only 1 case of measles was admitted to hospital, and no case of typhus was received. Ten cases of measles and 1 case of typhus remained under treatment in hospital on Saturday.

Deaths from diseases of the respiratory system numbered 19, being 3 over the average for the corresponding week of the last ten years, and 7 over the number for the week ended August 12. They consist of 13 from

bronchitis, 5 from pneumonia or inflammation of the lungs, and 1 from croup.

In the week ending Saturday, August 26, the mortality in thirty-three large English towns, including London (in which the rate was 20·8), was equal to an average annual death-rate of 21·6 per 1,000 persons living. The average rate for eight principal towns of Scotland was 20·3 per 1,000. In Glasgow the rate was 20·3, and in Edinburgh it was 18·8.

The average annual death-rate in the sixteen principal town districts of Ireland was 22·2 per 1,000 of the population, according to the Census of 1891.

The deaths from the principal zymotic diseases in the sixteen districts were equal to an annual rate of 5·1 per 1,000, the rates varying from 0·0 in Newry, Dundalk, Drogheda, Wexford, Sligo, and Armagh, to 10·0 in Waterford—the 13 deaths from all causes registered in the last-named district comprising 1 from measles and 3 from diarrhœa. Among the 131 deaths from all causes registered in Belfast were 1 from measles, 3 from scarlatina, 6 from whooping-cough, 1 from diphtheria, 2 from enteric fever, and 28 from diarrhœa. The 12 deaths in Londonderry comprised 1 from diphtheria and 3 from diarrhœa. The Registrar of Belfast No. 3 District makes reference to the prevalence of diarrhœa among children: the Registrar of Lisburn remarks:—"Diarrhœa (English cholera) very prevalent; several cases of scarlatina." The Registrar of Belfast No. 9 District states that the epidemic of English cholera and of diarrhœa appears to be subsiding.

In the Dublin Registration District the registered births amounted to 204—97 boys and 107 girls; and the registered deaths to 146—66 males and 80 females.

The deaths, which are 10 under the average number for the corresponding week of the last ten years, represent an annual rate of mortality of 21·8 in every 1,000 of the population. Omitting the deaths (numbering 2) of persons admitted into public institutions from localities outside the district, the rate was 21·5 per 1,000. During the first thirty-four weeks of the current year the death-rate averaged 27·1, and was 1·1 under the mean rate in the corresponding period of the ten years 1883-1892.

The number of deaths from zymotic diseases registered was 38, being equal to the number for the preceding week, and 12 over the average for the 34th week of the last ten years. The 38 deaths comprise 1 from influenza, 3 from whooping-cough, 1 from diphtheria, 3 from enteric fever, 4 from simple cholera and choleraic diarrhœa, 23 from diarrhœa (being 11 over the number from that cause in the preceding week, and 10 above the average for the 34th week of the last ten years). Twenty of the 23 deaths from diarrhœa were of children under 5 years of age, 12 being infants under 1 year old.

The number of cases of enteric fever admitted to hospital was 19, being a decrease of 3 as compared with the admissions for the preceding week: 17 enteric fever patients were discharged, 1 patient died, and 82 remained under treatment on Saturday, being 1 over the number in hospital at the close of the preceding week.

Six cases of scarlatina were admitted to hospital, against 7 for the preceding week: 7 patients were discharged, and 48 remained under treatment on Saturday, being 1 under the number in hospital on Saturday, August 19.

The hospital admissions for the week included, also, 8 cases of measles. Thirteen patients suffering from measles remained under treatment on Saturday, being an increase of 3 as compared with the number in hospital at the close of the preceding week. No case of typhus was under treatment in hospital on Saturday.

Deaths from diseases of the respiratory system numbered only 11, being 8 below the average for the corresponding week of the last ten years, and also 8 under the number for the week ended August 19. They consist of 6 from bronchitis, 4 from pneumonia or inflammation of the lungs, and 1 from corup.

In the week ending Saturday, September 2, the mortality in thirty-three, large English towns, including London (in which the rate was 19·0), was equal to an average annual death-rate of 20·6 per 1,000 persons living. The average rate for eight principal towns of Scotland was 20·7 per 1,000. In Glasgow the rate was 21·5, and in Edinburgh it was 20·4.

The average annual death-rate represented by the deaths registered in the sixteen principal town districts of Ireland was 25·3 per 1,000 of the population, based on the Census of 1891.

The deaths from the principal zymotic diseases in the sixteen districts were equal to an annual rate of 6·9 per 1,000, the rates varying from 0·0 in Dundalk, Drogheda, Wexford, Lurgan, Sligo, and Armagh, to 23·6 in Kilkenny—the 11 deaths from all causes registered in the last-named district comprising 1 from measles and 4 from scarlatina. Among the 138 deaths from all causes registered in Belfast were 6 from measles, 2 from whooping-cough, 5 from enteric fever, and 38 from diarrhœa. The 26 deaths in Cork comprise 1 from whooping-cough, 1 from enteric fever, and 1 from diarrhœa. Two of the 13 deaths in Londonderry were from measles. Of the 12 deaths in Waterford 1 was from scarlatina, 1 from typhus, and 1 from diarrhœa. The 8 deaths in Galway comprise 2 from typhus and 1 from diarrhœa. The 8 deaths in Lisburn comprise 3 from diarrhœa.

In the Dublin Registration District the registered births amounted to 203—105 boys and 98 girls; and the registered deaths to 195—94 males and 101 females.

The deaths, which are 22 over the average number for the corresponding week of the last ten years, represent an annual rate of mortality of 29·1 in every 1,000 of the population. Omitting the deaths (numbering 11) of persons admitted into public institutions from localities outside the district, the rate was 27·4 per 1,000. During the first thirty-five weeks of the current year the death-rate averaged 27·1, and was 1·1 under the mean rate in the corresponding period of the ten years 1883–1892.

The number of deaths from zymotic diseases registered was 57, being 19 over the number for the preceding week, and 20 over the average for the 35th week of the last ten years. The 57 deaths comprise 1 from measles, 3 from influenza and its complications, 5 from whooping-cough, 6 from enteric fever, 1 from choleraic diarrhœa, 34 from diarrhœa (being 11 over the number from that cause in the preceding week, and 14 above the average for the 35th week of the last ten years), 2 from dysentery and 1 from erysipelas. Twenty-seven of the 34 deaths from diarrhœa were of children under 5 years of age, 22 being infants under 1 year old.

The number of cases of enteric fever admitted to hospital was 45, being an increase of 26 as compared with the admissions for the preceding week. Nine enteric fever patients were discharged, 2 died, and 116 remained under treatment on Saturday, being 34 over the number in hospital at the close of the preceding week.

Eight cases of scarlatina were admitted to hospital, being 2 over the admissions for the preceding week: 7 scarlatina patients were discharged, and 49 remained under treatment on Saturday, being 1 over the number in hospital on Saturday, August 26.

The hospital admissions for the week included, also, four cases of measles. Fourteen cases of the disease remained under treatment in hospital on Saturday.

Only 11 deaths from diseases of the respiratory system were registered, being equal to the low number for the week ended August 26, and 10 below the average for the corresponding week of the last ten years. They comprise 5 from bronchitis and 5 from pneumonia or inflammation of the lungs.

In the week ending Saturday, September 9, the mortality in thirty-three large English towns, including London (in which the rate was 18·9), was equal to an average annual death-rate of 20·1 per 1,000 persons living. The average rate for eight principal towns of Scotland was 20·8 per 1,000. In Glasgow the rate was 21·7, and in Edinburgh it was 18·5.

The average annual death-rate in the sixteen principal town districts of Ireland was 20·4 per 1,000 of the population, according to the Census of 1891.

The deaths from the principal zymotic diseases registered in the sixteen

districts were equal to an annual rate of 5·5 per 1,000, the rates varying from 0·0 in eight of the districts to 8·7 in Belfast—the 112 deaths from all causes registered in that district comprising 2 from measles, 8 from whooping-cough, 1 from diphtheria, 1 from enteric fever, 30 from diarrhœa, and 2 from English cholera. Among the 33 deaths from all causes registered in Cork are 1 from enteric fever and 8 from diarrhœa. The 21 deaths in Limerick comprise 2 from measles and 2 from diarrhœa.

In the Dublin Registration District the registered births amounted to 180—84 boys and 96 girls; and the registered deaths to 147—76 males and 71 females.

The deaths, which are 18 under the average number for the corresponding week of the last ten years, represent an annual rate of mortality of 21·9 in every 1,000 of the population. Omitting the deaths (numbering 3) of persons admitted into public institutions from localities outside the district, the rate was 21·5 per 1,000. During the first thirty-six weeks of the current year the death-rate averaged 27·0, and was 1·1 below the mean rate in the corresponding period of the ten years 1883–1892.

The number of deaths from zymotic diseases registered was 40, being 6 over the average for the 36th week of the last ten years, but 17 under the number for the week ended September 2. The 40 deaths comprise 2 from measles, 4 from whooping-cough, 5 from diphtheria, 8 from enteric fever, 2 from cholerine, 19 from diarrhœa (being 15 under the number from that cause in the preceding week), and 1 from erysipelas. Sixteen of the 19 deaths from diarrhœa were of children under 1 year old.

Fifty-eight cases of enteric fever were admitted to hospital against 45 admissions for the preceding week, and 19 for the week ended August 26. Twelve enteric fever patients were discharged, 3 died, and 159 remained under treatment on Saturday, being 43 over the number in hospital at the close of the preceding week.

The number of cases of scarlatina admitted to hospital was 6, being a decline of 2 as compared with the admissions for the preceding week: 7 patients were discharged and 48 remained under treatment on Saturday, being 1 below the number in hospital on Saturday, September 2.

The hospital admissions for the week included, also, 12 cases of measles, being an increase of 8 as compared with the admissions for the preceding week: 21 measles patients remained under treatment in hospital on Saturday.

Deaths from diseases of the respiratory system numbered 13, being 2 over the low number for the preceding week, but 5 under the average for the 36th week of the last ten years. They consist of 9 from bronchitis and 4 from pneumonia or inflammation of the lungs.

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Meteorology.

Abstract of Observations made in the City of Dublin, Lat. 53° 20′ N., Long. 6° 15′ W., for the Month of August, 1893.

Mean Height of Barometer, - - -	29·965 inches.
Maximal Height of Barometer (on 29th, at 9 a.m.), -	30·396 ,,
Minimal Height of Barometer (on 21st, at 9 a.m.), -	29·290 ,,
Mean Dry-bulb Temperature, - - -	61·3°.
Mean Wet-bulb Temperature, - - -	57·9°.
Mean Dew-point Temperature, - - -	55·1°.
Mean Elastic Force (Tension) of Aqueous Vapour, -	·437 inch.
Mean Humidity, - - - - -	80·4 per cent.
Highest Temperature in Shade (on 15th), - -	79·8°.
Lowest Temperature in Shade (on 26th), - -	47·9°.
Lowest Temperature on Grass (Radiation) (on 28th)	41·6°.
Mean Amount of Cloud, - - - -	54·0 per cent.
Rainfall (on 16 days), - - - -	2·713 inches.
Greatest Daily Rainfall (on 18th), - - -	·516 inch.
General Directions of Wind, - - -	S.W., N.W.

Remarks.

Although changeable, as in 1892, and forming no exception to the rule that August is characterised by heavy rains, this was a record month as regards high temperature. On no fewer than 14 days did the thermometer exceed 70° in the shade, and the mean temperature was one degree above that of August, 1871, when it reached 62°. The present month also is remarkable for the magnificent display of lightning which occurred on the evening and during the night of the 9th. The cyclonic depressions, which are periodic in the last week of August, arrived about a week earlier than usual, the barometer falling to 28·80 inches off the west coast of Scotland on the 21st.

In Dublin the arithmetical mean temperature (63·0°) was much above the average (59·7°); the mean dry bulb readings at 9 a.m. and 9 p.m. were 61·3°. In the twenty-eight years ending with 1892, August was coldest in 1881 (M. T. = 57·0°), and warmest in 1871 (M. T. = 62·0°). In 1885, the M. T. was only 57·1°; in 1879 (the "cold year"), it was 57·7°; in 1887, 60·3°; in 1888, 58·2°; in 1889, 58·6°; in 1890, only 57·2°; in 1891, 58·1°, and in 1892, 60·0.°

The mean height of the barometer was 29·965 inches, or 0·068 inch above the corrected average value for August—namely, 29·897 inches. The mercury marked 30·396 inches at 9 a.m. of the 29th, and fell to 29·290 inches at 9 a.m. of the 21st. The observed range of atmospherical pressure was, therefore, 1·106 inches—that is, a little more than an inch and one-tenth.

The mean temperature deduced from daily readings of the dry bulb thermometer at 9 a.m. and 9 p.m. was 61·3°, or 3·7° above the value in August, 1888 and 1889, 5·0° above that in 1890, 4·1° above it in 1891, and 2·3° above it in 1892. It was also 0·8° above the value for July, 1893. Using the formula, *Mean Temp.* = *Min.* + (*max.*—*min.* × ·47), the mean temperature was 62·6°, or 3·3° above the average mean temperature for August, calculated in the same way, in the twenty-five years, 1865–89, inclusive (59·3°). The arithmetical mean of the maximal and minimal readings was 63·0°, compared with a twenty-five years' average of 59·7°. On the 15th the thermometer in the screen rose to 79·8°—wind, light and variable; on the 26th the temperature fell to 47·9°—wind, N.W. The minimum on the grass was 41·6° on the 28th.

The rainfall was 2·713 inches, distributed over 16 days. The average rainfall for August in the twenty-five years, 1865–89, inclusive, was 2·825 inches, and the average number of rainy days was 15·5. The rainfall, therefore, was slightly below average, while the rainy days were slightly in excess of the average. In 1874 the rainfall in August was very large—4·946 inches on 18 days; and in 1868 also 4·745 inches fell on, however, only 13 days; but the heaviest downpour in August occurred in 1889, when 5·747 inches were registered on 22 days. On the other hand, in 1884, only ·777 inch was measured on 8 days. In 1887, 1·520 inches of rain fell on 16 days; in 1888 1·270 inches on 12 days; in 1890, 2·799 inches on 19 days; in 1891, 4·953 inches on 25 days, and in 1892, 3·557 inches on 22 days.

High winds were noted on as many as 10 days, and attained the force of a gale on three occasions—namely, the 4th, 20th, and 21st. A thunderstorm of great severity occurred on the 9th. Thunder was also heard on the 18th. Lightning was also seen on the 13th and 18th. Temperature reached 70° in the screen on as many as 14 days. Hail fell on the 18th. It was foggy on the 12th, 13th, and 14th.

The weather remained changeable and showery, with fresh westerly (S.W. to N.W.) winds, throughout the period ended Saturday, the 5th. A new disturbance reached our northwest coasts on Tuesday, the 1st, leading to rain without much wind. On Wednesday afternoon, however, the barometer fell briskly and the wind backed to S.W. and freshened with a threatening appearance as a much more decided depression approached the N.W. of Ireland from the Atlantic. This system was quickly followed by another on Thursday night, so that by Friday the weather was thoroughly broken, squally and showery, in all parts of the United Kingdom. On the afternoon of this day thunderstorms and heavy rains occurred in London and many other places. A brisk recovery of pressure now took place and the wind drew towards N. and moderated, with fine, dry weather on Saturday. In Dublin the mean height of the barometer for the week ended Saturday, the 5th, was

29·861 inches, pressure ranging between 29·534 inches at 9 a.m. of Friday (wind, W. by S.) and 30·068 inches at 9 p.m. of Saturday (wind, N.). The corrected mean temperature was 60·4°. The mean dry bulb readings at 9 a.m. and 9 p.m. were 58·8°. The screened thermometers rose to 71·3° on Friday and fell to 52·4 on Tuesday. The rainfall was ·813 inch on five days, ·270 inch being measured on Wednesday. The prevailing wind was N.W. Changeable, but very warm and generally summerlike weather characterised the week ended Saturday, the 12th. On Wednesday and Thursday thunderstorms of quite exceptional intensity raged over many parts of England and Ireland, extending subsequently to parts of Scotland also. In Ireland, the distribution of atmospherical pressure was cyclonic, except on Tuesday and Saturday, when a continental anti-cyclone spread westwards as far as this country. As the general direction of the wind in the British Islands was southerly, temperature ranged very high—the thermometer rising to 85° or 86° at the inland English stations on Tuesday and Wednesday—even at Holyhead a maximum of 83° was reached on Wednesday. The highest in Paris on this same day was 91°. This tropical heat was the more remarkable, as the week commenced with very low temperatures, indeed, the minima recorded on Sunday morning were 46° in London and at Oxford, 44° at Leith, 43° at York, Loughborough, and Ardrossan; 42° at Sumburgh Head, 41° at Wick and Aberdeen, 40° at Stornoway, and 38° at Nairn! But the most striking phenomenon of the week was the violent thunderstorm of Wednesday night. In Dublin the lightning, which was almost incessant from dusk until after midnight, was extraordinarily vivid. The storm passed from S.S.E. to N.N.W. directly over the city between 10 and 11 p.m., in which time a quarter of an inch of rain fell. The mean height of the barometer was 29·951 inches, pressure ranging between 29·806 inches at 4 p.m. of Thursday (wind, S.E.) and 30·136 inches at 9 p.m. of Saturday (wind, S.). The corrected mean temperature was 65·5°. The mean dry bulb temperature at 9 a.m. and 9 p.m. was 63·8°. On Friday the screened thermometers rose to 77·7°, having fallen to 53·0° on Sunday. The rainfall was ·460 inch on four days, ·250 inch being recorded on Wednesday. The prevalent winds were S.W. and S.E.

Many years have passed since such really tropical heat has been experienced in Spain, France, and the British Isles, as that which has made the week ended Saturday, the 19th, memorable in meteorological annals. At Rochefort, on the west coast of France, the daily maxima were 102°, 106°, 91°, 93°, 100°, 90°, and 81°. In London the corresponding values were 81°, 85°, 87°, 90°, 92°, 93°, and 78°. On Thursday night the thermometer did not sink below 72° in London, and by 8 a.m. of Friday it had already risen to 84°. Even in Dublin a maximum of 79·8° was recorded on Tuesday, the 15th—this being the highest shade tempera-

ture registered in the Irish capital since July 16, 1876, when the phenomenal reading 87·2 was attained. On Tuesday the maximum at the Ordnance Survey Office, Phœnix Park, was 82·0°; at Glasnevin Botanic Gardens it was 80·6°. Only on the nights of Tuesday and Friday did the minimum fall below 60°. On every day the maximum exceeded 70°. There was an anticyclonic distribution of atmospherical pressure over western Germany, France, England, and Ireland until Thursday, when isobars became cyclonic and decided gradients for southerly winds formed over all parts of the United Kingdom. Thunderstorms of some severity occurred in the North of Ireland and the northern half of Great Britain on Tuesday night, while drenching showers of rain and hail fell in and about Dublin on Friday, accompanied by thunder. It is noteworthy that the weather was quite cool in Scandinavia throughout the week. In Dublin the mean height of the barometer was 29·965 inches, pressure ranging from 30·170 inches at 9 a.m. of Monday (wind, S.S.E.) to a minimum of 29·627 inches at 9 p.m. of Saturday (wind, S.). The corrected mean temperature was 67·9°. The mean dry bulb temperature at 9 a.m. and 9 p.m. was 66·6°. On Tuesday, the shade thermometers rose to 79·8°; on Saturday they fell to 58·1°. The rainfall was ·696 inch on two days ·516 inch falling in heavy showers on Friday, when some hail also fell. The prevailing wind was S.S.W. A good deal of fog hung about the coast on Sunday and Monday. The rainfall at Greystones, Co. Wicklow, was 1·035 inches on two days. The mean temperature of this week was 73·1° in London, 71·8° at Cambridge, 71·5° at Oxford and Loughborough, 70·5° at Southampton, 70·3° in Manchester, and 70·1° even at Scarborough on the sea.

Opening with typical cyclonic conditions and rough, rainy weather, the week ended Saturday, the 26th, closed with equally well-marked anticyclonic conditions and fine, quiet weather. On Sunday morning a large depression was found off the N.W. of Scotland. This system had caused a heavy rainfall during the previous night in most parts of Ireland and in some parts of Scotland. A few hours later a much more serious disturbance advanced towards the N.W. of Ireland from the S.W., causing a renewed and still heavier rainfall and moderate to fresh gales from S., S.W., and W. at several exposed stations. By 8 a.m. of Monday the barometer was down to 28·90 inches in Donegal, and by 6 p.m. a minimal reading of 28·83 inches was reached at Wick, in Caithnessshire. During the next three days the arrival of several shallow secondary depressions kept the weather in an unsettled, showery state. On Thursday, however, an area of high pressure began to spread over our south-western districts and the N.W. of France, and this brought cool, dry N.W. winds and finer and brighter weather. Towards the close of the period the nights became very sharp, the thermometer in the screen falling on Friday night to 47·9° in Dublin; 46·0° in London, as well as

at Wick, Belmullet, and Oxford; and 41·0° at Parsonstown. In Dublin the grass minimum was 41·7°. In Dublin the mean height of the barometer was 29·887 inches, pressure ranging from 29·290 inches at 9 a.m. of Monday (wind, W.S.W.) to 30·343 inches at 9 a.m. of Saturday (wind, N.W.). The corrected mean temperature was 59·6°. The mean dry bulb readings at 9 a.m. and 9 p.m. were 57.9°. On Sunday the thermometer rose to 68·6°; on Saturday it fell to 47·9°. The mean temperature was 8·3° lower than that of the previous week. Rain was measured on four days to the amount of ·718 inch, ·390 inch being entered to Sunday. The prevailing winds were first S.W., then N.W.

The last five days of the month were uneventful but favourable. An anticyclone of considerable intensity for the time of year lay throughout over Ireland and the Atlantic to the westward of this country. The weather was at first bright and cool, with northerly winds; but the sky afterwards became densely clouded, and on Thursday, the 31st, some rain fell with a N.W. wind. Temperature showed some recovery on this the closing day of the month.

The rainfall in Dublin during the eight months ending August 31st amounted to 14·379 inches on 108 days, compared with 9·455 inches on 96 days during the same period in 1887, 17·264 inches on 121 days in 1888, 18·893 inches on 134 days in 1889, 18·386 inches on 137 days in 1890, 15·888 inches on 117 days in 1891, 17·279 inches on 131 days in 1892, and a twenty-five years' average of 17·558 inches on 128·1 days.

At Knockdolian, Greystones, Co. Wicklow, the rainfall in August, 1893, was 3·275 inches distributed over 16 days. Of this quantity ·690 inch fell on the 19th. The total fall since January 1 amounts to 16·341 inches on 106 days, compared with 21·296 inches on 108 days in 1892.

DURATION OF HUMAN PREGNANCY.

THE *Gazette Médicale de Paris* notices a case reported in the *Centralblatt für Gynäkologie*, in which conception occurred four days after parturition, and normal delivery was accomplished 243 days afterwards. In commenting on this remarkable case M. Döderlein stated that, desiring to test the ordinary opinion that the average duration of pregnancy is 280 days from last menstruation and 273 days from fecundation, he had collected statistics of 1,500 deliveries at term. He concluded that the normal duration of pregnancy oscillated between 40 and 44 weeks, but that in the great majority of cases the period is 40 weeks. Pregnancies terminating at the end of the thirty-sixth and of the forty-fourth week are about equally numerous. These latter cases, however, are probably reducible to the normal 40 weeks. Pregnancies of 37, 38, 39, 41, 42, or 43 weeks' duration are comparatively rare.

PERISCOPE.

THE APOLLINARIS SPRING.

H. S. H. THE DUCHESS OF TECK and suite, who are staying at Bad Neuenahr, visited the neighbouring Apollinaris Spring on Friday, August 11. Her Royal Highness was conducted through the premises, and was much interested in watching the various operations of filling, corking, labelling, and packing the Apollinaris natural mineral water. The duchess was much impressed with the very large amount of carbonic acid gas contained in the spring, and proceeded for a few steps down toward the sunken courtyard in which the spring issued from the ground, in order to experience the effect of the gas. She afterwards caused her son, Prince Alexander, and her suite to do the same, in order to convince themselves of the volume and density of the carbonic acid gas there accumulated.

THE RÔLE OF THE POSTERIOR URETHRA IN CHRONIC URETHRITIS.

IN a paper read by Dr. Bransford Lewis, of St. Louis, before the June meeting of the American Association of Genito-Urinary Surgeons (*Medical Record*, June 29, 1893), the author presents some very radical and unorthodox views on the frequency of posterior urethritis and its influence in the production of chronic gonorrhœas. The various causes commonly accepted as sufficing to explain persistence in gonorrhœa were reviewed, and their potency as such were denied *seriatim*. Two cases were reported showing that the presence or absence of the gonococcus alone could not form a reliable criterion as to prognosis:—Case I. (primary), with abundant gonococci containing discharge, lasted six weeks; while Case II. (secondary), also giving abundant gonococci containing discharge, lasted only one week. The influence of anatomical abnormalities was restricted to only a small minority of the exceedingly numerous cases of chronic gonorrhœa, and did not explain the great number that occurred. The several varieties of urethritis, such as "granular urethritis," "catarrhal urethritis," "hypertrophic urethritis," &c., were only pathological incidents, not causes, of chronic gonorrhœa, and even on discriminating between these several varieties, the question still obtruded itself: What was it that had produced that particular variety? Again, urethral therapeutists, with ardently-advocated new remedies, supposed to be specifics, had all in turn failed in their endeavours to abolish prolonged claps. So that it must be acknowledged that the various factors to which chronic urethritis was usually attributed, while relatively important in a contributory way, did not cover

the ground in actual clinical experience, and something else must be found to bear the onus of being a prolific source of chronic gonorrhœa. While aware that infection of the posterior urethra was almost universally recognised, by advanced practitioners of the present day, as a complication of gonorrhœa that was difficult to cure when it did occur, that interfered with the usual course of treatment employed, and required special measures for its relief, &c., the author does not believe that the full importance of posterior inflammation is generally realised; that its frequency is even approximately estimated in general, or that its bearing on almost every case of gonorrhœa is understood, recognised, or acknowledged. In Dr. Lewis' opinion, the posterior infection should not be looked upon as a complication, but as a natural feature, occurring with such unfailing regularity that an observer, watching carefully and critically gonorrhœal cases, must see a great many of them before he would meet with a single one that remained free from the so-called complication throughout the disease. This conclusion, to which clinical investigation has led him, is supported, in recent writings, by the following statistics of authors who had been pursuing a similar study of late years. Lesser asserted that of fifty-three cases of primary gonorrhœa under his care, the posterior urethra escaped infection in only four cases, making the frequency of posterior urethritis 93·5 per cent. Jadassohn found posterior urethritis in 143 of 163 cases, making 87·7 per cent.; Róna found it in 79·7 per cent. of his cases; and Eraud found it in 80 per cent. of all of his cases. In endeavouring to harmonise this undoubted fact of frequency of posterior urethritis with the reason for its frequency, the author disregards, as inapplicable, explanations usually given. Sexual intercourse, the "forced" injection, the passage of instruments, &c., during an active gonorrhœa, were chiefly complained of by writers on the subject—extremely seldom by the patients themselves. Bearing on this point, the time and mode of onset of the posterior inflammation was of importance. Instead of the inflammation progressing slowly and gradually backwards over the urethral mucous membrane and reaching the posterior urethra in the second or third week, as was commonly taught, it reached the posterior urethra, in most cases, in the first (active) week of the disease. This rather favoured the supposition of Horteloup that the mode of infection was through the lymphatics rather than by continuity over the mucous surface. The author, therefore, feels justified in submitting the following conclusions:—1. The causes usually given for the prolongation of cases of clap (presence or absence of gonococci, stricture of large calibre, the use of particular drugs in treatment, &c.) do not satisfactorily explain them, nor do they furnish reliable means for prognosticating the outcome of a case. 2. A single widely prevalent cause for such prolongation of gonorrhœa has, as yet, not proved its right to recognition as such. 3. Posterior urethritis, by reason of its anatomical seclusion and

inaccessibility to ordinarily-prescribed treatment, if frequent, offers the best explanation for such prolongation or repeated recurrence. 4. Scrutinising clinical investigation shows posterior urethritis to be present in the great majority of cases of prolonged or severe gonorrhœa. 5. Direct, topical treatment to the posterior urethra is, therefore, necessary in the great majority of cases. 6. The causes usually given for producing posterior urethritis are not commonly found to be real factors in the clinic. 7. The mode of onset usually described does not coincide with that discerned in clinical observations. 8. These two latter observations confirm the probability that the posterior urethral infection is accomplished through the lymphatics, and explain the frequency of such infection. 9. Posterior urethritis is not a complication, but a natural phenomenon of gonorrhœa.

TOLYSAL.

Tolysal (salicylate of the paratolydimethylpyrazon) occurs in the form of light rose-coloured crystals, possessing a bitter astringent taste, slightly soluble in water, sparingly soluble in ether, but freely soluble in alcohol and acetic ether. Tolysal is non-toxic. Henning found no bad effects from it when given in large quantities to rabbits and guinea-pigs. He obtained good results from it in articular rheumatism, acute and chronic muscular rheumatism, phthisis, and diphtheria. He formulates his views thus:—(1) Give from 45 to 90 grains daily, commencing with a 30-grain dose and giving 15 grains every hour afterwards until the 90 grains are taken or the pain relieved. (2) Continue the treatment for a few days after the pain has disappeared. (3) For neuralgia a single dose of 15–30 grains is sufficient to relieve the pain. (4) As an antipyretic its properties are well-marked. It should be commenced with a 30-grain dose and followed by 15-grain doses every hour until the effect is produced. (5) It diminishes the frequency of the pulse and respirations. (6) The temperature falls to its lowest one hour after the administration of the dose, and the effect remains for an unusually long time. (7) On healthy persons the antipyretic effect of tolysal is very slight. (8) As an antirheumatic remedy, its effects are equally good with the most approved. (9) Tolysal is not accumulative. (10) It is possessed of hypnotic properties both in febrile and non-febrile affections. (11) Tolysal is an antizymotic and an antiseptic. (12) It is superior to quinine, kairin, salicylate of sodium, antipyrin, antifebrin, sulphate of thallin, phenacetin, agathin, and all other such remedies. Unfortunately tolysal has its drawbacks, and they are numerous: buzzing in the ears, heaviness, pains in the stomach, nausea, vomiting, rigors pending the elevation of temperature, cyanosis, dyspnœa, prolonged and exhausting sweats, deafness, muscular tremors, diarrhœa, rashes, collapse, and psychical troubles.—*Les Nouveaux Remèdes*, No. 9.

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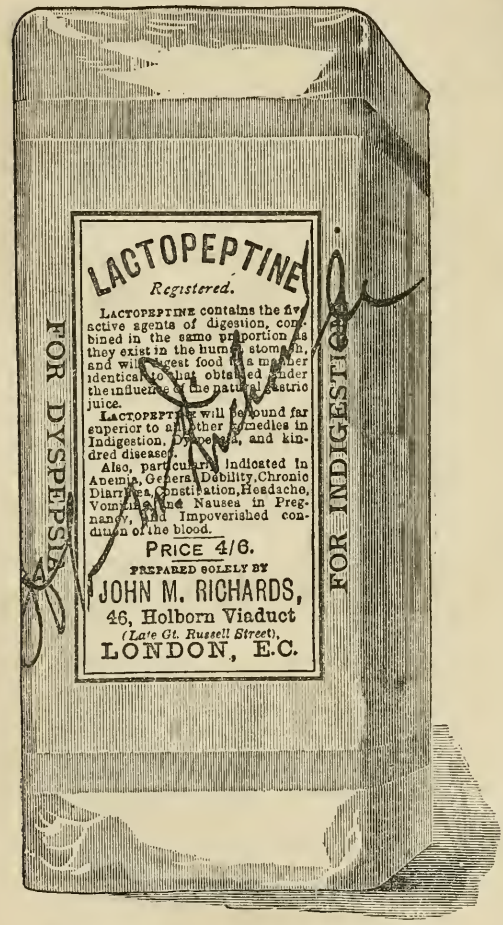
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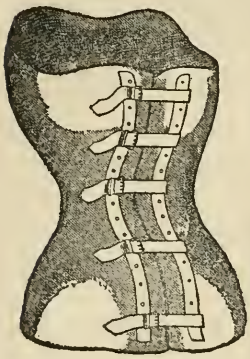


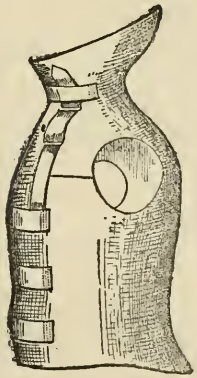
Instructions for Measurement, &c.

JACKET (*in cases of slight deformity*).

Circumference at axilla.
„ waist.
„ hips.
Length from axilla to great trochanter.

In severe angular cases circumference over apex of curve, position of same, and contour should be given; in lateral cases a description of the case.

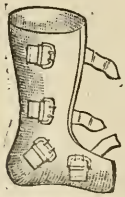
In all cases it should be stated if for male or female.



CERVICAL JACKET.

Same measurements required, and circumference at neck, and length from neck to axilla.

Any part of the Jacket can in the process of Manufacture be left Soft.



CLUB FOOT.

Circumference below knee.
„ ankle.
„ heel and instep.
Length from below knee to ground.
„ of foot.

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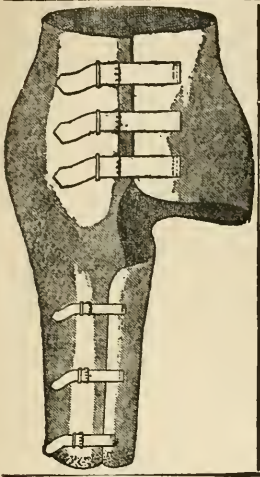

Instructions for Measurement, &c.

HIP SPLINT.

Circumference at waist.
" hips.
" thigh, top of
" above knee.
Length from waist to groin.

State if for right or left side.

LEG SPLINT.

Circumference at top of thigh.
" above knee.
" at knee.
" below knee.
" calf.
" ankle.
Length from groin to centre of knee.
" centre of knee to ankle.

State if for right or left leg.

When the foot-part is required, also circumference of heel and instep, and length from centre of knee to ground.

If the limb is contracted the contour should be given.

Splints are also made in Poroplastic for fracture of Inferior Maxilla, Humerus Elbow-Joint, Forearm, Thigh, Knee-Joint, Leg, Shoulder-Joint, Hand, &c.

These Splints can be fitted perfectly to the Patient if softened either by hot water or in a Heater made for the purpose. When mounted with webbing, hot water will do; if with leather, a Heater should be used. The material becomes quite hard again in two or three minutes.

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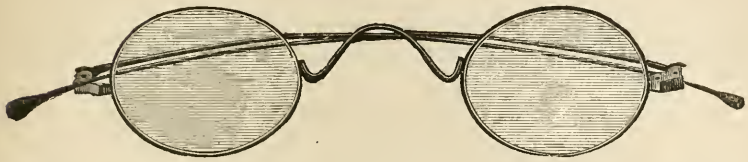

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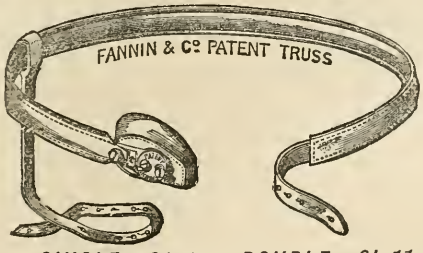

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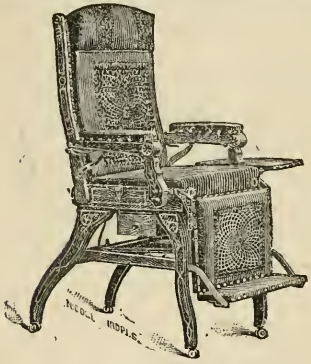

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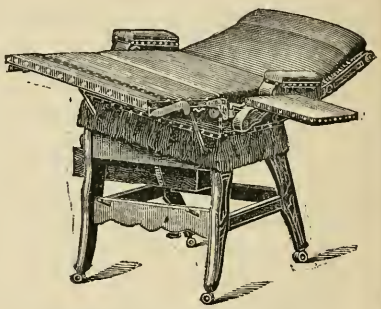
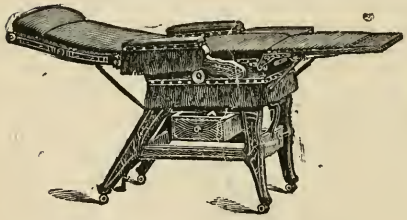
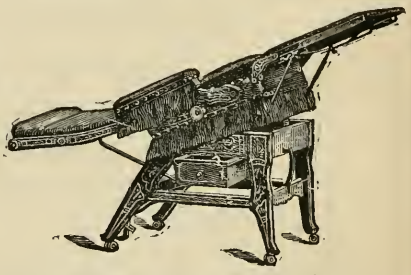
Can be also used as an Ordinary Office Chair.



Lateral or Sinus Position.
This position is important to gynæcologists, and in treatment of rectal diseases, with side table for instruments.



Horizontal Position



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